March 1, 1948

STEEL

The Magazine of Metalworking and Metalproducing

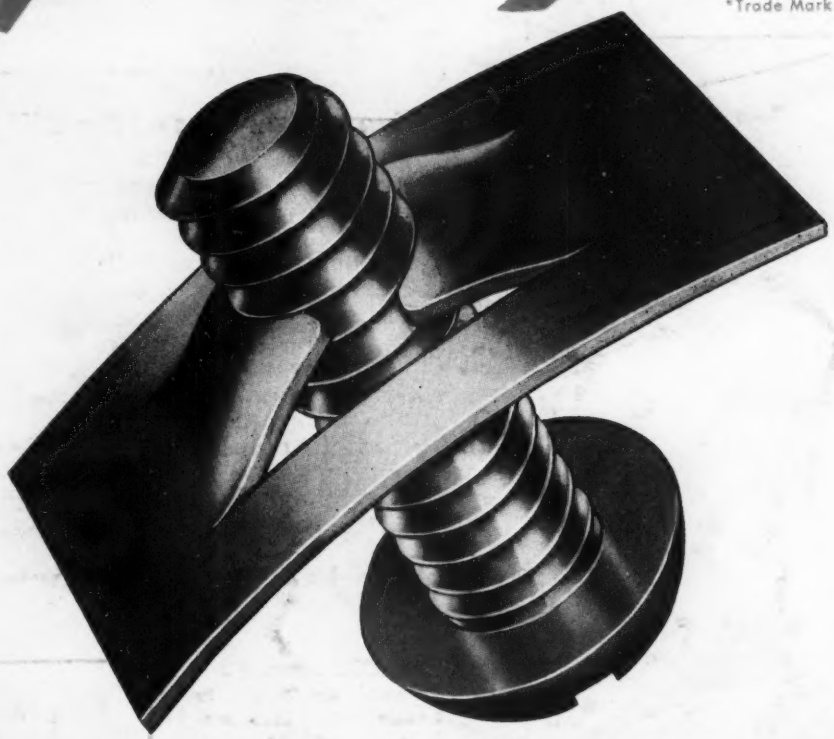
ESTABLISHED 1882

EDITORIAL INDEX, PAGE 51

TINNERMAN

Speed Nuts*

*Trade Mark Reg. U. S. Pat. Off.



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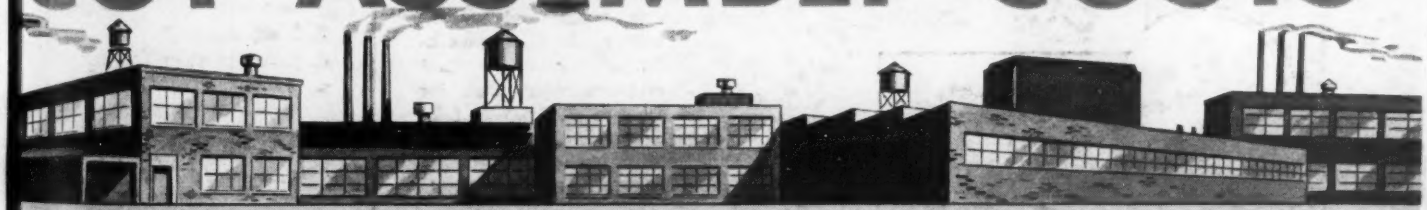

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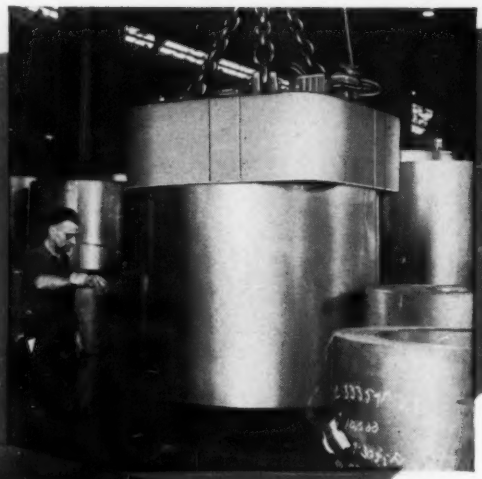

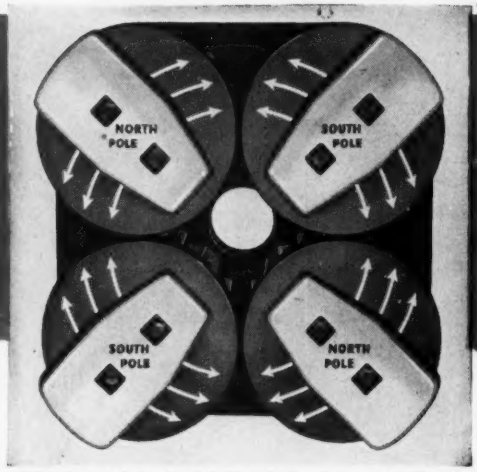

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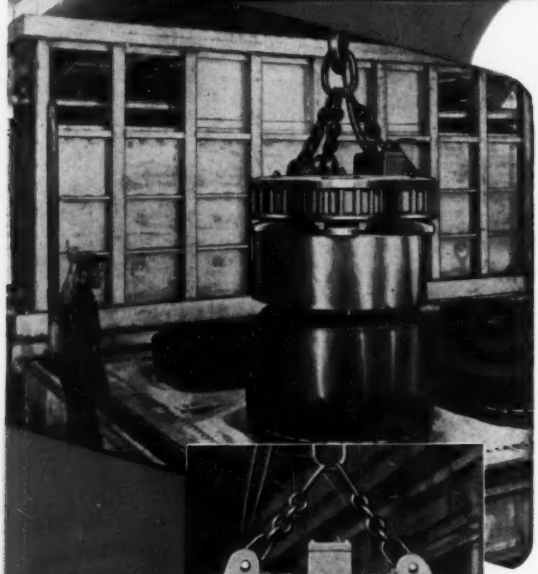

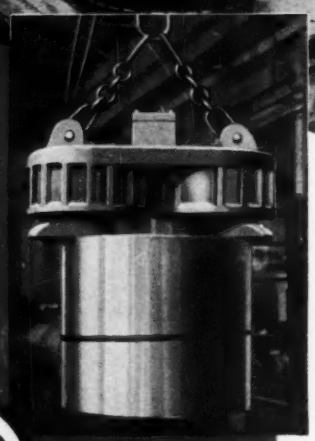

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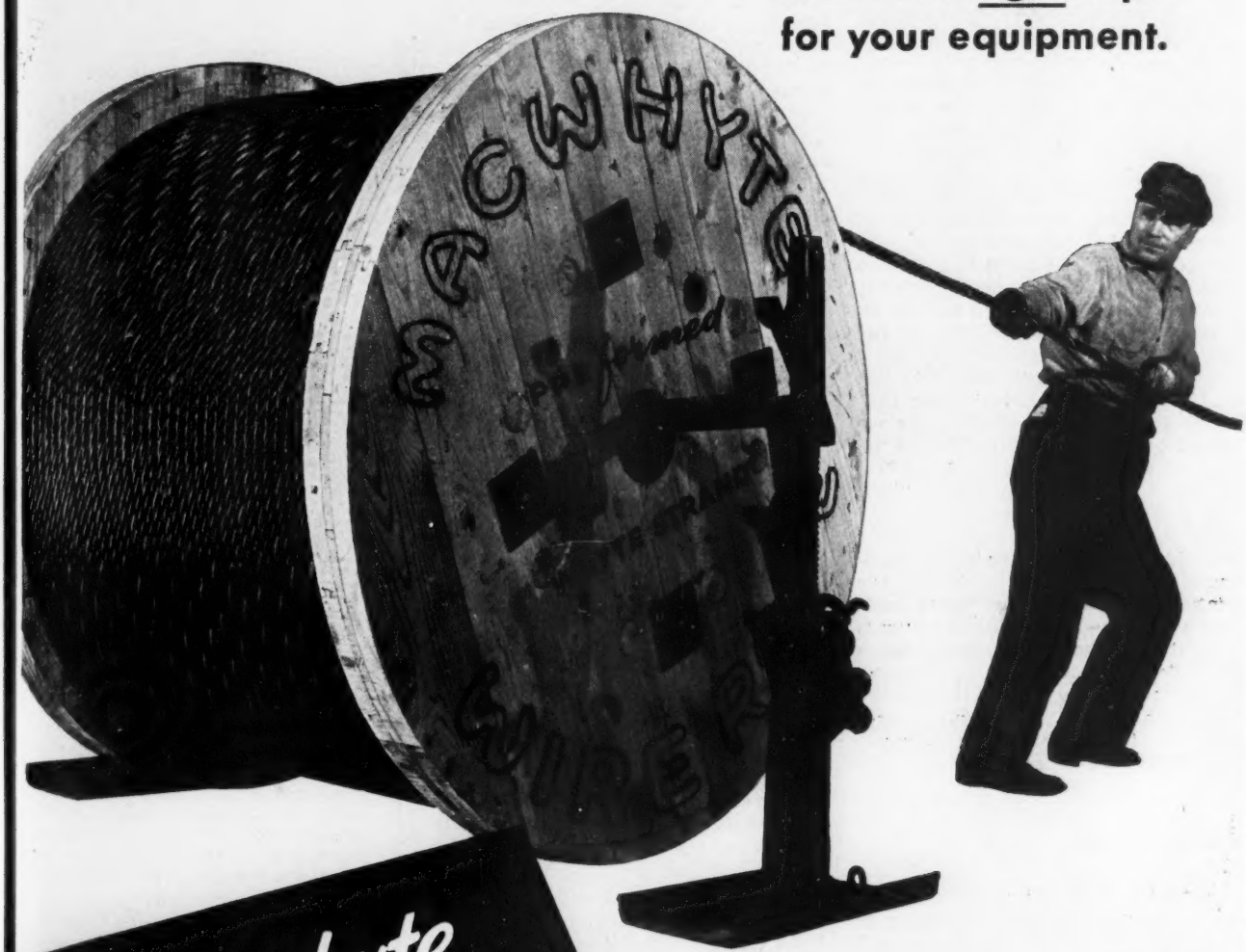

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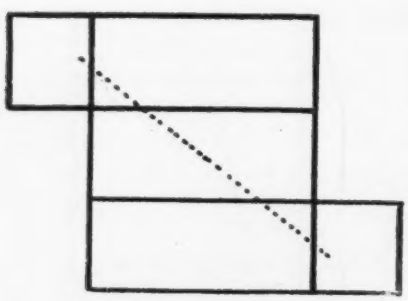
Behind the Scenes...

Readers & Kraut

One of the nicest yarns we've heard in a long time comes from L. E. Browne, our New England editor. Brownie has been deep in the heart of New England from the day of his birth and knows practically every stone in every building in those six states. The other day he was having lunch in Jake Worth's in Boston, which for the benefit of the non-Bostonian in the group we hasten to explain is famous for pigs' knuckles and kraut. Just after he had ordered his pk & k but before they were delivered, Brownie was called to the phone by the district manager of a steel company, who had a hot tip on a news break. While waiting for the food to appear, Brownie had been reading a copy of STEEL, which he left on the table. After finishing the call, which took about 20 minutes, he returned to find a note scribbled on the back of a piece of cardboard, reading as follows: "This is a fine publication and one of the best I have ever seen. I congratulate you. (signed) An Old Timer, 35 years in the business." Brownie says he hasn't the slightest idea who the unknown reader was, although he's sure the man is a right guy, because he didn't mooch Brownie's pig knuckles — although they were cold by the time the phone call was over. "Eventually," says Brownie in a philosophical mood, "you'll find all types in Jake's!"

Puzzle Corner

In order to avoid mass mayhem, we're giving a graphic solution of how the answer to the fly & wall problem happens to be 40 feet. In this



pictorial, all the walls of the room are laid out flat for easy illustration. The fly took an angular course, walked up to the ceiling, across to a side wall, down to the floor, across a corner of the floor, and up the other end wall to his mate. Yes, sir, 40 feet!

From K. P. Leckie of Electric Auto-Lite Ltd., across the lake from us, comes this puzzle which he admits to having pilfered from Canadian Line Materials, Ltd. Seems that a guy named Joe was walking along a railroad track at a smart three miles per hour. Jake, his second cousin once removed, was doing the same thing, simultaneously, but in the opposite direction. Along comes the inevitable train, passing Joe in five seconds but passing Jake in six seconds. Now how long was that train?

National Week Week

If you are thinking of establishing a new special occasion for our national calendar, such as National Welding Rod Week, or Forgings Day, or maybe even Know-Your-Stanchion-Supplier-Better Month, you would do well to latch on to a new publication issued by the Department of Commerce. It's a 25-page pamphlet, costs 10 cents, called Special Days, Weeks and Months in 1948. After all, you wouldn't want your stanchion dealer to have to compete with such attractions as national sweater week, or national laugh week! Our compilation, by the way, proves that this calender is the only one in which there are more than 366 days, 52 weeks, or 12 months in 1948.

Reprints To Be Had

We have had extra copies of last week's sheet survey made up to meet the demand, and we'll be happy to send you one for free if you'd like it. We'll also be happy to sell you ten for a buck, or you can buy as many as you want at $7 per hundred. We have by now lost count of the total number of orders we've received, but it's well up in the thousands.

Shrdlu

(Editorial Index—Page 51)

STEEL

Vol. 122—No. 9 March 1, 1948

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Editorial Staff on Contents Page

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Business Staff on Page 4

NEXT WEEK . . .

Selecting Automotive Steels

Industrial Fatigue

Western Steelmaking Enterprise

ASTE Exposition Preview

Surface Defects in Rolled Products

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 122, NO. 9 MARCH 1, 1948

NEWS

★ As the Editor Views the News 53
★ News Summary 57
Furor Follows Price Advance in Semifinished 59
FTC Attorney Outlines Strategy 60
★ Present, Past and Pending 61
Views Differ on Gray Market 62
Farmer Blamed for Implement Gray Market 63
Bryant Urges European Aid Include Tools 64
Metalworking Wages 40% of Factory Total 65
Freight Car Output Seen Up in March 65
★ Windows of Washington 66
Scrap Importation Facilitated 69
German Scrap Poses Problems 69
British Steel Needs in 1948 Exceed Supply 70
Belgians Push Trade, Output Up 70
French Aim at Fiscal Stability 71
★ Mirrors of Motordom 73
Bearings Exports Climb in 1947 76
★ Briefs 77
★ The Business Trend 78
★ Men of Industry 80
★ Obituaries 85
★ Construction and Enterprise 172

TECHNICAL

★ Engineering News at a Glance 87
What's in the Future for Atomic Energy in Industry 88
Modern Die Casting Practice—Conclusion 90
Preparing Surfaces for Metallizing 93
Skilled Die Making Permits Intricate Drawing 96
Brass Smelting Speeded by New Materials Handling Methods 100
Closely-Controlled Forming Operations 102
Third Southern Machinery and Metals Exposition 107
Short Courses in Quality Control Offered to Inspectors 107
Machine Tool Industry Prepares for Competition 108
★ Progress in Steelmaking—Stack Lining Repairs 110
★ New Products and Equipment 133
★ Helpful Literature 147

MARKETS

★ Market Summary 149
★ Market Prices and Composites 150
Nonferrous Metal Supplies Continue Tight 154
Scrap Prices Turning Downward 166

★ *Index to Advertisers* 180

★—Denotes regular features.

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MORGAN WORCESTER

March 1, 1948

Faux Pas

A fortnight ago several steel companies advanced prices of semifinished steel, whereupon an unprecedented hullaballoo arose.

A senator who is also an industrialist declared "the steel industry apparently does not realize the nature of the public interest in its business policies." Other senators hinted that the excess profits tax should be reimposed and that the steel industry should be regulated as if it were a public utility. Senator Taft's Joint Economic Committee voted to ask steel executives for an explanation. President Truman ordered the Justice Department to investigate. Many staunch friends of the steel industry were puzzled.

Why is it that this particular price hike aroused so much criticism?

One reason is that the increase came just before third-round wage demands were due for a decision. Many persons jumped to the conclusion the price increase meant big steel was set to grant a wage increase.

Another reason is that the price advance followed so closely on the heels of the break in commodities that it embarrassed everybody who had banked on the assumption that the backbone of inflation had been broken.

Another reason was that ever since steel industry executives and John L. Lewis entered into last year's pact of wages for workers in captive mines, many persons who normally are sympathetic to steel's problems, have been worried about the excessive power vested in a few industrialists and labor leaders. The price increase accentuated this anxiety.

As a final reason, this is an election year and Republicans and Democrats alike are super-sensitive to implications that they are to blame for inflation. This price increase forced them to put on a watch dog act for political purposes.

The situation boils down to this. In increasing prices to meet increased costs steel producers repeated what they and other manufacturers have done many times before. However, the timing was unfortunate in that it failed to take into account the present mood of the nation. A relatively few individuals made decisions which, unfortunately, have reacted against the entire industry.

Pertinent now is the question of whether or not this distressing experience will shock the leadership of steel into a more realistic appreciation of its responsibility to its industry and its public.

* * *

THE HOODOO ON SCRAP: In view of the tremendous effort that has been made to accelerate the flow of scrap to steel mills, the results still are far from satisfactory. One reason is that there seems to be a persistent hoodoo on scrap collecting. Let some enterprising individual or company discover an attractive source of scrap and immediately bureaucratic gremlins, sticklers for red tape and other self-appointed meddlers begin to trot out a thousand and one reasons why this particular scrap cannot be used.

For instance, Bethlehem Steel purchased a million tons of scrap from the Chinese. When the first shipments began to arrive United States customs officials ruled that the material had to be classified and held in bonded warehouse until Bethlehem actually scrapped it. The Senate Small Business Committee went to work on this blockade and finally succeeded in getting the scrap released to Bethlehem under bond.

The scrap mission sent to the British and American zones in Germany reports it found

(OVER)

a potential source of 10 million tons of scrap. However, German scrap dealers are reluctant to sell. Gremlins have cooked up a deal whereby the scrap would be paid for in dollars which go into the joint export-import account of Bizonia, but the dealers would be paid in worthless reichsmarks.

From time to time somebody uncovers potential scrap in a government agency. Sometimes a little of it is released, but more often the gremlins concoct numerous arguments why it cannot be made available now.

But sooner or later, the scrap hoodoo will be broken. —p. 69

* * *

EQUIPMENT FOR ERP: **A. G. Bryant, president of the National Machine Tool Builders' Association, suggested to the House Committee on Foreign Affairs that substantial benefits** would accrue to American industry and that European rehabilitation can be accomplished in less time and with less cost if large shipments of American machine tools were included in the proposed European Recovery Program.

One point brought out by Mr. Bryant is that with proper machines in the right places in Europe, European nations might be able to make equipment which otherwise might have to be furnished by equipment builders in the United States, many of whom already have more business than they can handle. For instance, would or would not more machine tools in Europe cut down the number of railroad cars to be built here for Europe under ERP?

This idea of extending aid in the form that will least disrupt operations here has attractive possibilities and it may apply to equipment in numerous categories. —p. 64

* * *

RECORD TRUCKLOADINGS: Hauling freight over the nation's highways has become an important part of the American transportation system. In 1947 the volume of shipments transported by motor carriers broke all previous records. The index of average monthly tonnage compiled by the American Trucking Associations Inc. mounted to 206 per cent of the 1938-1940 average, exceeding the previous peak of 1943 by 20 points.

While shipment of iron and steel by motor truck often becomes a "must" for individual shipper or consignee or both, the volume of such traffic represents a surprisingly low percentage of total motor truck freight volume. Currently iron and steel shipments constitute only about 4 per cent of the tonnage hauled on rubber over the highways. —p. 78

* * *

ANOTHER GRAY MARKET: In recent months there has been a strong tendency in some quarters to blame the steel industry for the so-called gray market in steel. Testimony presented in the numerous hearings and investigations on gray market steel invariably has shown that the producers not only have no connection with gray market operations but have gone to great pains to discourage customers from offering steel in these markets.

In reality, the basic cause of gray markets is excess of demand over supply. Wherever that excess is substantial, a gray market will be found. This was true in automobiles and now it is rampant in agricultural machinery. Today farm equipment is being bought all over the country at fantastic prices. One farmer offered $4000 for a $1800 tractor. Another paid $2950 for a $1436 machine.

Gray and black markets are the result of an unbalanced market condition and are not the exclusive headache of any single industry. —pp. 62, 63

* * *

A FASCINATING FIELD: In a brief discussion of the vast amount of research and engineering development work that must be accomplished before atomic energy can be converted into heat or electricity on a commercial basis, J. A. Hutcheson, associate director of Westinghouse Research Laboratories, refers to the "limited pool of nuclear physicists and chemists now available" for this job.

Undoubtedly the scarcity of experienced personnel is a formidable problem at the present time. However, past experience in this country has been that young men are strongly attracted to interesting new fields of science and technology. This has been true in every new specialized field in electricity, chemistry and metallurgy during recent decades.

Everything surrounding nuclear fission has been attended by so much mystery, glamour and excitement that it is likely that young men will be drawn into this fascinating new specialty as if by a magnet. If so, the inadequacy of personnel may be short-lived. —p. 88

E. L. Shaner

EDITOR-IN-CHIEF

A FUNNY APPROACH TO A SERIOUS MATTER

when it's gotta' fit

Of course, we don't mean to imply that even Brandt can fit square pegs into round holes. However, if somebody wanted that absurdity, Brandt workmen wouldn't be afraid to tackle it. There's a saying among them that "When it's *gotta' fit* . . . they come to Brandt."

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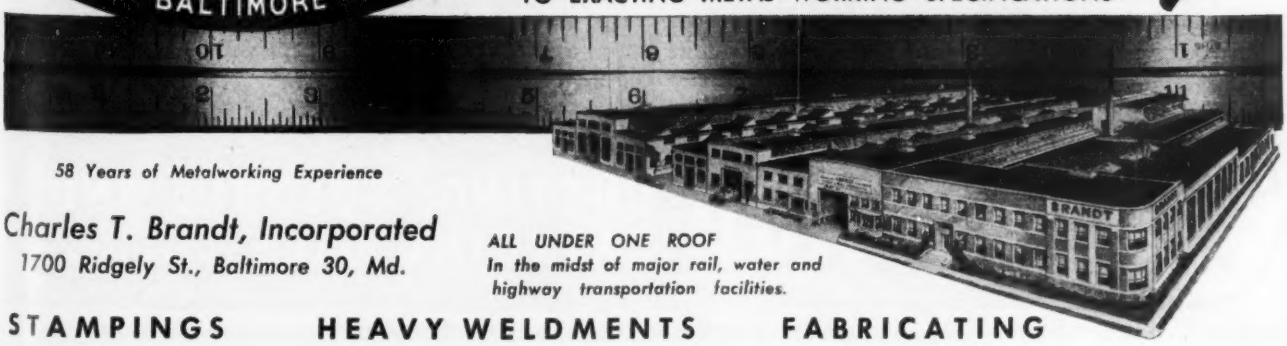

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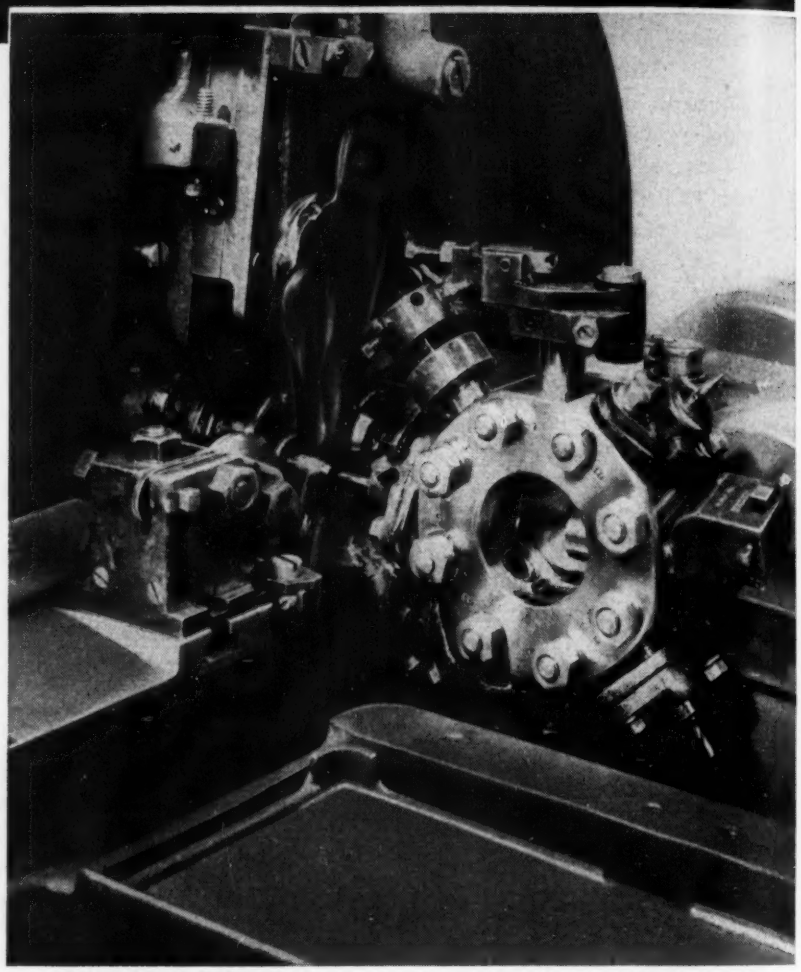

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News Summary

PRICE FUROR—Seldom has a steel price announcement created the furor which followed the recent adjustment in semifinished steel quotations (p. 59). To steel men the attention focussed on this action appears to be all out of proportion to the increases involved. Semifinished steel produced for sale amounts to less than 4 per cent of total steel shipments. Considerable tonnage of this material has been sold in the open market at prices much higher than those quoted by the major producers, which in some cases were little more than the going price of scrap. Yet, the Federal Bureau of Investigation launches an investigation, a congressional committee schedules an inquiry, and many politicians seize the price action as an opportunity to lambaste the steel industry, one of its favorite whipping boys. The probable reason: Poor timing. The announcement came shortly before wage negotiations open and just after the softening in the commodity markets. And, of course, this being election year made the politicians sensitive to the change in price.

METALWORKING PAYROLLS—Iron, steel and its customers account for nearly 40 per cent of total wages and salaries in manufacturing, according to an analysis (p. 65) of government data made by the American Iron & Steel Institute. The primary steel industry, machinery, electrical equipment and transportation industries in 1946 accounted for $14.1 billion of a total $36 billion manufacturing payroll.

REPLACEMENT COSTS—Increasing concern is being expressed by metalworking companies over the probable inadequacy of current depreciation allowances to cover replacement cost of existing facilities when it becomes necessary to rebuild them. Industrial construction costs have risen 83 per cent since 1939. Machinery and equipment costs have advanced substantially. Chrysler Corp. in its annual report (p. 73) observes that original cost of its buildings, machinery and equipment was $210 million; replacement costs at today's prices would be $352 million.

EUROPE—British steel requirements will exceed maximum anticipated supply by three quarters to one million tons in 1948. Essential demands are placed at 15¼ to 15½ million tons against 14 million tons of home production and a half million tons of imports (p. 70). . . . Belgian export trade (p. 70) continues to increase, after a temporary lapse due to devaluation of the French franc.

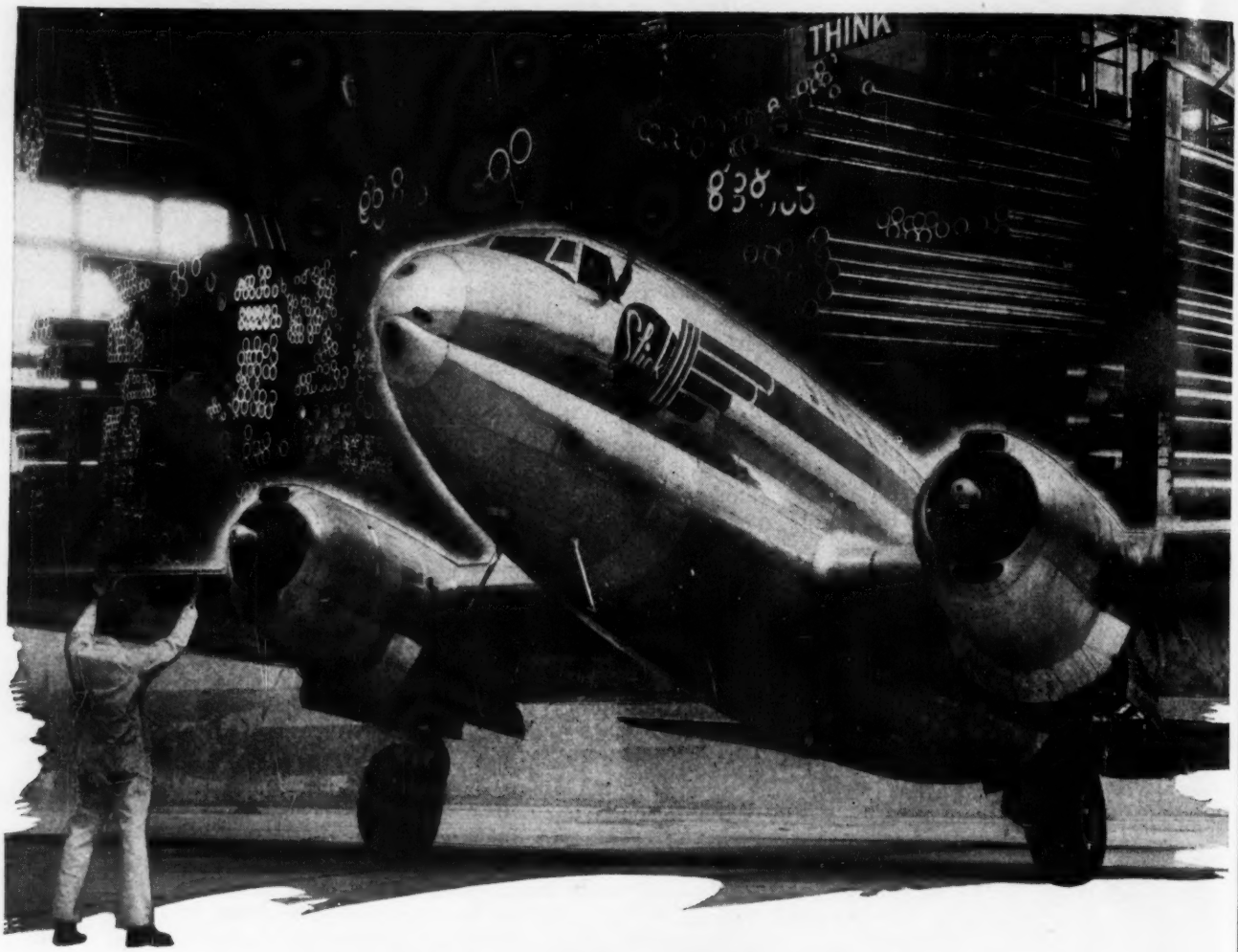
GRAY MARKETS—Fewer metalworking companies are receiving offers of steel from brokers than formerly (p. 62). This may mean that the gray market is forming its own channels and that brokers now are selling mostly to established gray market customers. Quotations are reported higher than a few months ago.

MACHINE TOOLS—Rehabilitation of Europe could be accomplished in less time and with less expense if substantial shipments of modern American tools were included in the proposed European Recovery Program (p. 64). This is the opinion voiced by A. G. Bryant, president, National Machine Tool Builders' Association, who points out that modern American machine tools made available to the 16 European countries in the Marshall Plan would aid substantially in attainment of production goals in those countries.

FREIGHT CARS—Government officials are predicting that the freight car building program of 10,000 units monthly will be attained in March (p. 65). April's total is expected to exceed that figure.

SIGNS OF THE TIMES—Government indexes are beginning to show the results of the recent break in commodities. Wholesale price index dropped 2.5 per cent in the latest week (p. 78), raw materials showed a 4.9 per cent decline, and manufactured goods are off 1.4 per cent. . . . Exports of bearings in 1947 were valued at $26 million, more than double foreign shipments in 1946 (p. 76). . . . Scrap imports from China (p. 69) have been cleared for delivery to American steel mills.

Engineering News, P. 87 *Market Summary, P. 149*



Taking the Distance Out of Your Steel Problems

Urgently needed by a Los Angeles engineering company, was a large shipment of stainless steel pipe in a special size. A call to the Ryerson plant in Los Angeles disclosed that the required pipe was not in Los Angeles stock, but *was* on hand in another city.

Ryerson Los Angeles immediately phoned Ryerson in Chicago. Could Chicago supply the desperately needed pipe? Chicago could—and did! The material was quickly trucked to a Chicago airport, flown to Los Angeles, and delivered at the customer's plant the following morning, less than 24 hours after the order was received.

That's how Ryerson—when the steel *is* available—can take the *distance* out of your steel problems. That's how the twelve closely cooperating plants of the Ryerson Steel-Service System often accomplish the seemingly impossible in an incredibly short time. And that's the sort of far-reaching service you can look for when you contact any Ryerson plant for any steel requirement.

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

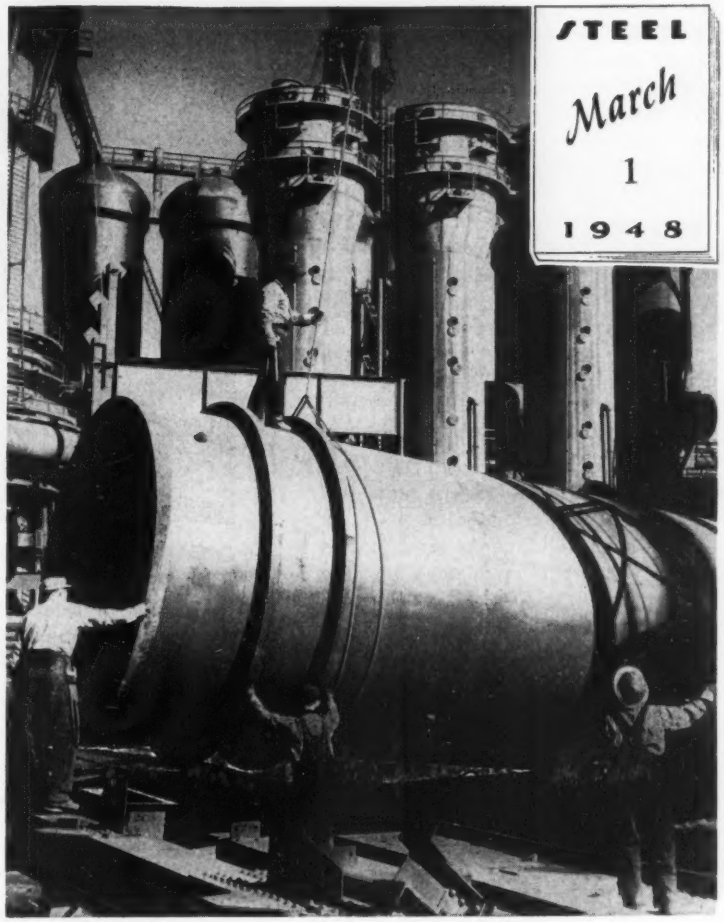
PRINCIPAL PRODUCTS

Bars—hot and cold rolled	Mechanical Tubing	Tool Steel
alloy steel	Boiler Tubes and Fittings	Wire, Chain
reinforcing	Allegheny Stainless—	Bolts, Rivets
Structurals	sheets, plates, shapes,	Babbitt
Plates—	bars, tubing, etc.	Metal Working Tools
Inland 4-Way Floor Plate	Sheet and Strip Steel	& Machinery, etc.

RYERSON STEEL

Furor Follows Price Advance In Semifinished

Producers explain adjustments necessitated by past cost increases do not indicate general price mark-up. Washington isn't satisfied and orders FBI probe. Congressional committee to question steel executives



New steel producing facilities are costing more. Integrated capacity built at today's prices costs about $250 per ton, compared with about $50 a ton for existing capacity. Shown above is a new blast furnace built at South Chicago by United States Steel, which last year spent $206 million for new facilities

NO GENERAL increase in finished steel prices is foreshadowed by the recent advances in semifinished steel quotations.

Nor are the adjustments in semifinished prices related in any way to the "substantial" third round wage increase being demanded by the United Steelworkers.

These reassurances came from top leaders in the industry last week in response to the public furor resulting from the change by some producers in quoting semifinished steel products on a net ton instead of a gross ton basis. The changeover resulted in an increase of between 11 and 12 per cent in semifinished prices quoted by some producers.

Political Fuel—That the upward adjustments in semifinished steel would be used as political fuel became apparent quickly, with these developments:

1. Federal Bureau of Investigation agents, under orders by President Truman, launched an investigation of the price increase to determine whether there was any violation of the antitrust laws.

2. The Joint Economic Committee of Congress summoned three top steel executives to appear before it Mar. 2 to explain the increase. Industry men asked to appear are B. F. Fairless, president, United States Steel Corp.; A. B. Homer, president, Bethlehem Steel Co.; and Hiland G. Batcheller, president, Allegheny Ludlum Steel Corp.

3. Sen. Joseph C. O'Mahoney (Dem., Wyo.), former chairman of the Temporary National Economic Committee, declared the price action "virtually asks Congress to declare the steel industry a public utility." Senator O'Mahoney said he would sponsor a bill providing for the adoption of an excess profits tax and an appropriation sufficient to permit the Federal Trade Commission to publicize the methods used by big business to increase prices.

4. The semifinished steel price increase was widely criticized by congressmen and administration spokesmen as being ill-timed, coming on the eve of new wage contract negotiations and in the face of declining commodity prices.

Industry Defends Action — U. S. Steel President Fairless said the readjustments in semifinished prices, amounting to about a quarter of a cent a pound, was "caused by the cumulative effect of past cost increases resulting in these semifinished products being sold (by Carnegie-Illinois) at a loss. In other words, this adjustment was for the purpose of correcting this existing unsound relationship between costs and prices.

"The adjustment was made to take care of a particular situation of limited scope. It has nothing to do with future wage demands, and should not be understood as indicating any trend in general steel prices."

Mr. Fairless pointed out that the semifinished material affected represents less than 4 per cent of the industry's total steel shipments for 1947.

"Those unfamiliar with costs in the steel industry may not realize that the prior price of rerolling billets, for instance, was $45 a gross ton and that the lowest confirmed price paid in Pittsburgh for scrap used in the production of the same billets was $40.50 per gross ton."

Commenting on the increase, Edward L. Ryerson, chairman, Inland Steel Co., Chicago, said his company's price advance applied only to semifinished products constituting less than 2 per cent of the company's total shipments. He emphasized that

the advance was not general, and that the semifinished products affected are sold by Inland to only four customers. Last year, he said, the semifinished products were sold at a loss or at a profit per ton far below the firm's general average. Because of this unsatisfactory return the company had given thought to either discontinuing the sale of such semifinished products or advancing the price. It determined to continue production because of the needs of the four customers involved who could not secure the material elsewhere.

Mr. Ryerson further stated that it had been advised by one of its customers on Feb. 13 that a price adjustment had been made by the U. S. Steel Corp. and that on Feb. 14 this information was published in the daily press. On Feb. 17, he said, Inland decided to advance its prices effective Feb. 20. While several other and more important products of Inland should sell at higher prices to assure a satisfactory return, said Mr. Ryerson, Inland has made no decision to change these prices at present. He emphasized, however, that if the nation is to have a strong and expanding steel industry the prices charged for steel products must be adequate to provide for growth and to attract investment capital.

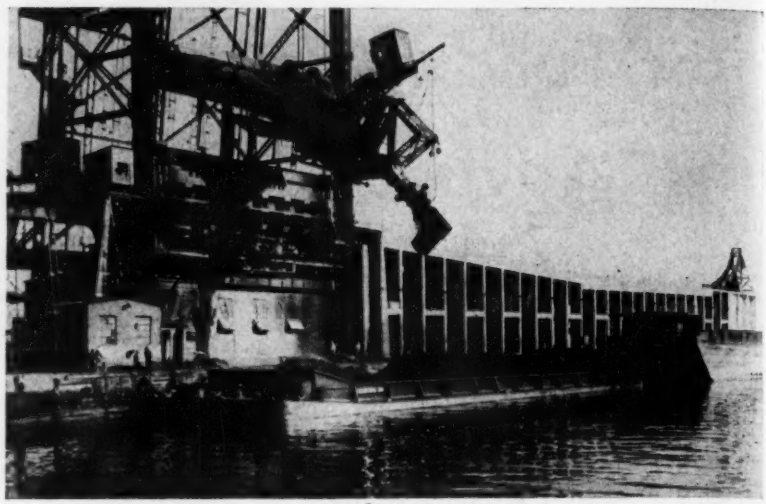
Increase Not Uniform—FBI agents attempting to gather evidence that the increase was uniform and was made simultaneously by the producers ran into difficulties early in their investigation. Several large producers had not announced any changes in semifinished prices more than a week after the first increases were announced.

Actually, steel men believe far more attention is being paid to the recent readjustment than is warranted.

It is pointed out that relatively few producers sell semifinished steel, and in the case of some sellers the tonnage involved is comparatively small and sold to a limited number of customers. Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, O., last week, in response to a query, said his company uses all of its steel in its own finishing mills and does not have any semifinished for sale.

Two large steel interests in the Pittsburgh district are selling semifinished only in a few instances, largely of off-grade analysis products, or for government directive tonnage. Another company in the district is out of the market on semi-

(Please turn to Page 170)



COAL BARGES LOADED: More than 3 million tons of coal are moved annually by all-welded steel barges to supply fuel for utility plants on the shores of Delaware and Schuylkill rivers in the Philadelphia area. Photo shows coal being loaded into vessel from railroad car dumper. Barges were built by Dravo Corp., Pittsburgh, and are operated by the Oliver Transportation Co., Philadelphia

FTC Attorney Outlines Strategy

Will attempt to show steelmakers acted in concert in announcing steel prices and that companies actually sold material at quoted prices to government

GOVERNMENT strategy in attempting to substantiate its charges that steel prices are arrived at through illegal conspiracy has been outlined by Lynn C. Paulson, the Federal Trade Commission's trial attorney.

First, said Mr. Paulson, he will attempt to show there was a concert to establish steel prices by "announcement." That is his main purpose in asking the steel companies to supply the price announcements, extra lists and other price data they have issued in past years.

Second, he said, he proposes to establish that the steel companies then actually sold at the prices they had announced. That is one of the purposes in introducing procurement information from the Navy and the Tennessee Valley Authority. He wants to show that the steel companies quoted identical prices to the government, and that when the government bought it actually paid the prices quoted uniformly.

"I will show," he said, "that the steel companies announced identical prices, and I will show that these were not nominal prices but were the prices at which the steel companies later sold their products."

"Benchmark" Quotations? — How steel counsel will handle their end of this particular aspect of the steel case was not fully disclosed. But a hint was conveyed when one of the attorneys asked questions about the admissibility of questioning government witnesses to show that the prices at which steel actually was sold were not the prices that had been publicly announced and, further, that the steel companies had no intention, at the time of announcement, of observing the announced prices.

Mr. Paulson replied that he would not object to cross examination along this line provided it is of an incidental character. But he said he had no intention of allowing such cross examination in a volume that might threaten to drag out the hearings "for months and years."

Counsel Clash—Three sharp clashes featured the latest series of hearings—two of them won by steel counsel and one by Mr. Paulson. The steel men won out in two instances through rulings of Trial Examiner Frank Hier, while in the third Mr. Paulson brought a long debate to a close by deciding to invoke the government's subpoena powers.

The first clash occurred during the examination of John L. Neely, Tennessee Valley Authority procurement

analyst, Knoxville, Tenn., when Mr. Neely was called upon to identify and establish the authenticity of documents covering a particular steel purchase by the TVA in 1940. Included were: 1—An abstract of all the bids on this particular steel schedule; 2—the bids submitted by each steel company on this schedule, and 3—the certificate of award of the contract.

It quickly developed that the certificate of award had been introduced inadvertently, and Mr. Paulson withdrew it—but not before steel counsel had noted, and pointed out for the record, that the contract, according to the wording of the certificate, had been awarded to the Tennessee Coal, Iron & Railroad Co. as "the lowest bidder." The wording of the certificate, of course, was in contradiction to Mr. Paulson's purpose of showing that "matching" prices had been quoted on this lot of TVA steel. Examiner Hier threw out all these exhibits on the ground that the wording to the effect that the contract had gone to TCI as the "lowest bidder" cast doubt upon the probity value of the other documents in the effort to prove "matching" prices.

The second clash came over a lot of similar material from the Navy Bureau of Supplies and Accounts. The examiner rejected an abstract of bids, and the individual bids of the steel companies, on a 1940 Navy schedule, because of failure of FTC counsel to establish the identification of these records.

Counsel Reprimands Examiner — This particular clash was featured by sharp language to the trial examiner on the part of Mr. Paulson. The latter resented Mr. Hier's attempt to enforce existing rules governing admission of exhibits in cases of this type. "This is the biggest case of its kind in the country's history," declared Mr. Paulson, "and you are going to be called on to establish some new rules and precedents. If you are going to insist on the proving of each unimportant detail to an absurd degree, you will cause the hearings to drag out indefinitely—or perhaps bog down. If we are to get on with this case, you will have to follow a policy of taking the bull by the horns."

This raised a rather touchy point—as nobody in the employ of the Federal Trade Commission likes to be accused of stretching out these costly hearings to an undue degree. Nevertheless, Examiner Hier ruled against Mr. Paulson in this exchange.

The third clash, in which both sides intimated the other was not living up to its assurances, developed over the circumstances under which price announcements and extra cards issued by the steel companies between May 27, 1935, and Aug. 19, 1947, may be introduced.

Mr. Paulson wanted to get all these exhibits entered during March to clear the way for hearings on new lines of investigation in April. "I am going to put dynamite in this case in April—and in May," said Mr. Paulson in an off-the-record discussion, "and I do not propose to be interrupted and delayed by steel counsels' examination of witnesses on the subject of this steel price historical data."

Insist on Identifications — Steel counsel held out stubbornly for the right to have the price data identified by witnesses to be called from the steel companies, and to question these witnesses. They generally agreed to furnish the material starting on March 8, but wanted permission to bring in their witnesses in April. Their proposition was: (1) That Mr. Paulson and his staff look over the material and decide which of it they wanted to introduce; (2) that the material to be used in the case be formally introduced in April with the assistance of qualified witnesses from the steel companies; (3) that Mr. Paulson give them assurance that no conclusions drawn from the price-history data in any way be used in this case without first introducing all the data from which it was taken.

This debate was concluded by Mr. Paulson's summary decision to call upon the examiner to subpoena the steel respondents for this material, and thus avoid a couple of months' delay the other procedure might entail. In the subpoena procedure the steel companies will be required to produce their witnesses, if they desire to produce witnesses, at the same time they put in their price records, and they must limit their questioning to proving the identity and authenticity of the documents presented. Introduction of this material, already accomplished as far as several smaller companies are concerned, is to start for the big respondents on March 8 when Carnegie-Illinois Steel Corp. is to lead off.

Mr. Paulson did not disclose the nature of the "dynamite" he proposes to inject into the case in April. Tentatively April 5 has been set for the opening of the April hearings, with the location still to be decided.

Present, Past and Pending

■ SEES RETURN OF COMPETITIVE SELLING

SCHENECTADY, N. Y.—Westinghouse Electric Corp. by the end of this year will be competitively selling instead of allocating electric appliances, Gwilym A. Price, president, predicts.

■ TUBE MILL NEARS PRODUCTION STAGE

GADSDEN, ALA.—Republic Steel Corp. expects to have its tube mill here in production about July 1. It will fabricate large diameter pipe.

■ NEW $150 MILLION PIPELINE CONSIDERED

NEW YORK—Texas Eastern Transmission Corp. is considering laying a third line on its present right-of-way to move natural gas into the New York area. The line would be 26-in. and would cost $150 million.

■ KAISER-FRAZER TO DISCONTINUE NIGHT SHIFT

DETROIT—Night turn operations at the Kaiser-Frazer Corp. plant at Willow Run, Mich., will be discontinued early in March in a company economy drive.

■ STEEL ALLOCATION PROCEDURE OUTLINED

WASHINGTON—Iron & Steel Division of Office of Industry Co-operation last week gave the Steel Producers Advisory Committee details of procedure to be followed by the steel industry in allocating steel. A. A. Wagner, manager of hot-rolled sales, Jones & Laughlin Steel Corp., has been added to staff of the Iron & Steel Division, OIC.

■ JAPANESE STEEL TO BE BROUGHT TO U.S.

LOS ANGELES—Yarus & Co., 724 South Spring St., has government approval to barter with the Japanese Board of Trade 30,000 long tons of coking coal in return for 25,000 metric tons of sheet steel. For first quarter, Japan also is offering 600 tons of galvanized iron sheets, 1500 tons of reinforcing bars, 90 tons of wire nails, and odds and ends.

■ KEYSTONE STEEL SUPERINTENDENT DIES

PEORIA, ILL.—Alphie E. Getz, 53, associated with Keystone Steel & Wire Co. 31 years, the last 14 as open hearth superintendent, died Feb. 25 here.

Views Differ on Gray Market

Some consumers insist substantial steel tonnage moving in this market but others hold high prices asked are discouraging prospective buyers

CLEVELAND — Conflicting reports continue to circulate as to the gray market steel tonnage moving. Although some consumers insist the tonnage is substantial in that many companies find it necessary to rely on gray market steel to keep operations going, others point out the price asked by gray marketeers has gone so high many prospective buyers are priced out of that market.

Leading some steel consumers to believe less gray market tonnage is moving now than in earlier months is the fact their refusal to show interest in offerings has apparently resulted in their being removed from gray marketeers' mailing lists. However, others hold that is no indication there has been a decline in volume of gray market steel moving, for perhaps the tonnage now goes regularly to consumers who have shown an interest in it. Seemingly bearing out the latter is the report gray market prices have risen in recent months.

Daisy Chain—Adding to the difficulty of determining gray market volume is the offering by several brokers of the same lots of steel, this practice making it appear more tonnage is moving than actually may be the case.

Most of the tonnage offered is hot and cold-rolled sheets. While there is a wide range in prices asked, the most common price being paid for sheets in this area appears to be 12c a pound, or $240 a ton. Prices asked now for sheets, any gage, hot or cold-rolled, are reported to range from $160 to $360 a ton, not including freight charges.

Quality is reported to range widely too, some of the sheets said to be wrinkled and wasters. However, some prime sheets were reported offered at 18c a pound. For self protection, most purchasers buy only with the provision they be permitted to inspect the steel before accepting it.

One consumer which gets half its 500-ton-monthly steel requirements from the gray market recently was offered sheets for 10½c a pound but found the one who offered the tonnage actually could not deliver it.

Threaten To Close—Disliking the gray market and finding it unprofitable to pay gray market prices, some consumers assert they will close down rather than pay such amounts.

Possibility that the demand for gray market steel will increase is seen in the report companies depending to some extent on conversion deals for steel meet increasing difficulty getting ingots rolled and may

SHIPMENTS OF STEEL PRODUCTS IN DECEMBER AND ENTIRE 1947 YEAR

Steel Products	Number of companies	Items	DECEMBER - 1947			To Date This Year			Whole Year 1946		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	43	1	322,147	5.7	237,137	* 3,105,646	4.9	2,257,445	1,949,624	4.0	1,645,748
Structural shapes (heavy)	13	2	379,614	6.8	41	4,436,129	7.0	2,640	3,474,284	7.1	5,399
Steel piling	4	3	28,711	0.5	-	324,224	0.5	23	205,313	0.4	141
Plates (sheared and universal)	29	4	590,777	10.5	17,832	6,345,216	10.0	219,227	4,152,181	8.5	250,709
Skelp	7	5	8,775	0.2	17,389	160,989	0.3	384,004	227,033	0.5	194,666
Rails—Standard (over 60 lbs.)	4	6	190,245	3.4	-	2,207,146	3.5	991	1,790,311	3.7	4,890
—All other	5	7	20,980	0.4	-	211,900	0.3	329	144,999	0.3	426
Joint bars	7	8	13,249	0.2	527	173,923	0.3	15,198	176,803	0.4	5,327
Tie plates	9	9	44,334	0.8	337	* 504,779	0.8	* 4,437	447,496	0.9	18,700
Track spikes	8	10	11,862	0.2	13	* 163,746	0.3	* 146	146,194	0.3	695
Hot Rolled Bars—Carbon	34	11	520,892	9.3	73,647	* 6,242,416	9.9	745,770	5,006,859	10.3	707,994
—Reinforcing—New billet	15	12	111,876	2.0	987	1,277,075	2.0	9,775	1,048,483	2.1	7,381
—Rerolled	12	13	15,763	0.3	-	175,853	0.3	-	141,346	0.3	1,267
—Alloy	27	14	142,625	2.5	19,068	* 1,741,432	2.8	212,382	1,390,278	2.8	138,399
—Total	45	15	791,156	14.1	93,702	* 9,436,756	15.0	967,927	7,586,966	15.5	855,034
Cold Finished Bars—Carbon	29	16	101,689	1.8	637	1,426,701	2.3	9,249	1,316,579	2.7	2,428
—Alloy	26	17	15,129	0.3	344	* 218,802	0.3	2,601	196,237	0.4	1,725
—Total	35	18	116,818	2.1	981	* 1,645,503	2.6	11,850	1,512,816	3.1	4,153
Tool steel bars	19	19	6,724	0.1	88	* 87,279	0.1	* 1,670	96,020	0.2	274
Pipe & Tubes—Butt weld	15	20	154,080	2.7	5,048	1,706,415	2.7	68,321	1,276,289	2.6	49,393
—Lap weld	8	21	32,681	0.6	54	389,762	0.6	875	305,516	0.6	258
—Electric weld	11	22	106,624	1.9	367	1,122,350	1.8	2,380	674,459	1.4	594
—Seamless	10	23	192,772	3.4	11,912	2,082,686	3.3	139,926	1,871,540	3.8	83,441
—Conduit	7	24	15,158	0.3	648	155,335	0.2	8,497	98,521	0.2	2,448
—Mechanical and pressure tubing	13	25	56,760	1.0	1,640	661,336	1.0	20,438	429,180	0.9	3,476
Wire rods	22	26	50,358	0.9	26,568	667,282	1.1	331,192	679,998	1.4	346,506
Wire—Drawn	39	27	230,639	4.1	15,436	2,590,963	4.1	181,783	1,933,124	4.0	135,592
—Nails and staples	18	28	60,329	1.1	613	799,436	1.3	8,481	636,632	1.3	797
—Barbed and twisted	15	29	23,526	0.4	60	256,991	0.4	128	207,610	0.4	-
—Woven wire fence	13	30	30,177	0.5	202	407,295	0.6	3,616	383,230	0.8	-
—Bale ties	12	31	9,904	0.2	-	119,917	0.2	-	99,993	0.2	-
Black Plate—Ordinary	9	32	72,689	1.3	145	801,745	1.3	2,033	781,167	1.6	3,179
—Chemically treated	8	33	988	-	-	19,252	-	-	125,170	0.3	-
Tin and Terne Plate—Hot dipped	9	34	199,151	3.6	-	2,093,149	3.3	228	1,924,657	3.9	-
—Electrolytic	9	35	170,596	3.0	-	1,617,659	2.6	529	909,173	1.9	-
Sheets—Hot rolled	31	36	666,730	11.9	53,035	7,300,881	11.6	578,041	5,521,463	11.3	421,198
—Cold rolled	17	37	489,342	8.7	3,878	5,447,189	8.6	28,498	4,075,554	8.4	3,397
—Galvanized	16	38	138,676	2.5	169	1,609,881	2.5	889	1,462,053	3.0	1,725
—Electrical and enameling	10	39	57,362	1.0	-	590,917	0.9	385	435,170	0.9	-
Strip—Hot rolled	23	40	148,992	2.7	31,730	1,740,085	2.8	308,655	1,363,812	2.8	237,178
—Cold rolled	35	41	134,438	2.4	2,676	1,613,005	2.6	28,030	1,282,146	2.6	25,904
Wheels (car, rolled steel)	5	42	28,219	0.5	-	356,873	0.6	2	252,308	0.5	348
Axles	5	43	17,455	0.3	-	185,019	0.3	53	130,461	0.3	221
All other	-	44	-	-	-	-	-	-	6,266	-	-
TOTAL STEEL PRODUCTS	142	45	5,613,036	100.0	522,228	*63,138,659	100.0	*5,578,867	48,775,532	100.0	4,297,889

* Adjusted.

resort to gray market offerings. Reportedly putting a crimp in conversion deals is the refusal of some steel companies with open rolling capacity to roll ingots produced from scrap bought at above formula prices.

New Firm Leases Space For Sheet Production

An automotive company and other metalworking interests are reported associated with Frank A. Weidman, president, Steel Producers Inc., Pittsburgh, a newly formed corporation which has leased space in the Toronto, O., plant of the Follansbee Steel Corp. to be devoted to production of hot and cold-rolled sheet steel.

Arrangements have been made with Follansbee to complete certain finishing operations, such as annealing, slitting and cold (skin pass) finishing on a 2-high cold mill.

Equipment for production of hot-rolled sheets is being installed and plans call for operations to get under way in mid-April. It is reported about $500,000 will be spent on mill equipment, which, among other items, includes one 3-high sheet bar rougher and two 2-high hand mills.

Mr. Weidman states it is too early to disclose the names of other company officials but said that unidentified "end-users" have acquired an interest in his company. These steel consumers are expected to receive the bulk of the company's estimated monthly output of 3000 tons.

Resumption of Canton Open Hearths Planned

Barium Steel & Forge Inc., Canton, O., division of Barium Steel Corp., New York, is reported planning to resume operations in its open-hearth steel plant which has been idle for some time past. It is understood that two 35-ton open-hearths are being readied for operation. The division's rated capacity is placed at 50,000 net tons annually, but it is said present plans do not call for operation of one 15-ton open-hearth furnace.

Sufficient scrap commitments are understood to have been made to supply these furnaces at practical capacity at least through the remainder of the year. It is also said arrangements have been made for conversion of the ingots to finished products. In this connection it is also reported Barium is seeking to purchase a blooming mill for partial conversion of the ingots produced at Canton.

Farmer Blamed For Implement Gray Market

CHIEF cause of today's gray market in agricultural machinery is the farmer himself. This is the principal conclusion from the wealth of testimony taken by the House Committee on Agriculture during its recent investigation of dislocated market conditions in this field.

In his present state of affluence the farmer would rather pay a thousand dollars or so extra in order to get a machine that will increase his production. For example, it was brought out that much of the 1947 soybean and corn crops are still in the field because of machinery shortages.

In a nutshell the economic situation surrounding the gray market in farm machinery was as follows on Feb. 7: The average price of all farm machinery stood at 137.2 per cent of the 1935-1939 base; for all commodities the index figure was 220.7 per cent; for farm products the index stood at 260.8 per cent—and this is considerably less than recent high marks for farm prices. On this scale of values, it seems, the farmer can afford to pay almost any price rather than do without essential machinery.

Offers Above List—Paul M. Mulliken, executive secretary, National Retail Farm Equipment Association, an organization with a membership of 17,178 farm equipment retailers, told the committee about the experience of a dealer in west central Iowa with a tractor-hungry farmer. The farmer traced a shipment of tractors to the dealer and in calling on the dealer took out a roll of $20 bills. In his effort to tempt the dealer to divert a tractor from a customer to whom it had been promised the farmer offered $2200 above list—$4000 for an $1800 tractor.

Some gray market prices paid, it was reported to the committee, were $2950 for a new John Deere tractor with factory price of $1436.25, $3250 for a McCormick-Deering tractor worth $2072.50 at the factory, $2300 for a small Massey-Harris clipper combine priced $1377.50 at the factory, $550 for a J. I. Case grain drill worth $215 at the factory. In general, used farm machinery brought about 25 per cent over current factory prices on new machinery.

The farmer also received most of the blame for furnishing equipment for sale in the gray market. Most of the equipment sold in the gray market came from farmers who had bought it at list prices from authorized dealers. However, as Mr. Mulliken stated, "in many cases serial numbers are defaced, indicating that while this business is not at all illegal, someone had a guilty conscience at least."

Testimony showed that the most serious shortages exist in tractors.

Zinc Institute Meets in St. Louis, April 15-16

American Zinc Institute will hold its 30th annual meeting at the Hotel Statler, St. Louis, on April 15 and 16.

D. Stewart, of United Co-Operatives Inc., will speak on "What's Ahead for Metals in the Farm Market." Prof. D. G. Carter, of the University of Illinois, will discuss opportunities for industry in the farm market. R. C. Todd, sales consultant, American Rolling Mill Co., will report on the steel industry in 1948; and R. A. Young, vice president, American Zinc Co. of Illinois, will review the outlook for the zinc smelting industry in 1948.

Other speakers will include J. D. Conover, American Mining Congress, who will review Washington news; Dr. James Boyd, who will discuss the relationship of the Bureau of Mines and the mining industry; and H. W. Steinkraus, whose subject is industrial relations.

Dr. C. L. Wilson, of the Missouri School of Mines, will talk on "The Mining Engineer's Place in the Current Economy." S. D. Straus, sales manager, American Smelting & Refining Co., will discuss the world situation in zinc.

Lubrication Men Meet In Buffalo, April 19-21

American Society of Lubrication Engineers will hold its third annual convention and exhibit at Hotel Statler, Buffalo, Apr. 19-21.

Discussions will cover every phase of industrial lubrication, including lubrication engineering, chemistry and physics of lubrication, evaluation of cutting oils, grinding oils, synthetic oils and greases.

Warehousemen Schedule Convention May 11-12

American Steel Warehouse Association Inc. will hold its 39th annual meeting at the Drake Hotel in Chicago, May 11 and 12. Association president is Walter S. Doxsey, 442 Terminal Tower, Cleveland.

Bryant Urges European Aid Include Tools

BENEFITS would accrue to American industry and European rehabilitation could be accomplished in less time and with less expense if substantial shipments of modern American machine tools were included in the proposed European Recovery Program.

Such was the advice tendered by A. G. Bryant, president, National Machine Tool Builders' Association, to the Committee on Foreign Affairs of the House of Representatives recently.

Chief motivations for this testimony were the absence of any provision in the Marshall Plan for European purchase of machine tools and the belief by the American tool building industry in the absolute necessity of machine tools if recovery is to be made.

Aid Cuts Seen Possible — Citing typical examples in the stated industrial requirements of the participating countries as drawn up by the Committee of European Economic Co-operation last fall, Mr. Bryant pointed out that perhaps some of the equipment needs which now appear impossible of being met except from the United States could be filled if the productive capacities of these countries were expanded by use of modern machine tools.

Among the equipment needed in excess of that available through self-help are coal mining machinery, refinery apparatus and transportation facilities, he said, with the first two requiring $607 million and $588 million worth, respectively, from outside sources. As envisioned in CEEC's report, 103,000 freight cars would also be required in addition to 621,000 seen as feasible to build in the participating countries. Modern American machine tools made available to the 16 countries could aid in attainment of the goals and might alleviate some of the pressure for aid from foreign sources, particularly from the United States, he said.

Provision for Loans Needed—Pointing out to the committee the basic nature of machine tools in all production—"food as well as manufactured articles," he asserted that "before any of the nations can reestablish their economies, they must make a major investment in these basic tools." Such tools could be secured now with loans from the Export-Import Bank, but he said he had been advised by the bank that it can make loans only on adequate security and is not in a "position to assume this task." Under these circumstances, Mr. Bryant declared, "certainly so important a part of reconstruction should be clearly provided for and carefully planned."

Ability of American builders to provide European assistance in the form of tools was exposed in detail in his testimony. The industry, with annual capacity of about $600 million, would be able to increase its volume substantially without expanding its facilities; many general purpose machine tools, furthermore, are now in long supply and could be delivered abroad quickly, if dollar exchange were available. This dollar shortage, he advised, is currently handicapping foreign nations which want tools.

Newest Models Desired—Tool purchases which were made before import regulations were tightened demonstrated that foreign demand is concentrated in the newest and best rather than in war surplus tools.

Supplying American funds for purchase of machine tools abroad would be wasteful and inefficient in his opinion because of the American industry's currently idle capacity. Tools required by the European nations should be made available on request by the foreign industrialists who would use them, and these selections should be screened by American production experts with arrangements for repayment over a period of years made for as much of the equipment as possible. Under this plan, he advised, orders would then be placed through normal commercial channels to avoid error and delay.

PIN DRAFTER: Substantial production savings are being chalked up by textile mills employing the Warner & Swasey "pin drafter" to ready yarn for spinning. The new machine combines the functions formerly performed by several machines in a single unit

Rust Rebuilds Three Furnaces for Carnegie

Three slab reheating furnaces at Carnegie-Illinois Steel Corp.'s Irvin Works at Pittsburgh are being rebuilt by Rust Furnace Co. The work will increase by 50 per cent the steelmaking capacity of the furnaces at this U. S. Steel facility.

The rebuilt furnaces will supplement a new 115-ton billet heater designed and installed last year by the same contractor. When completed, the billet heating capacity of the rebuilt furnaces, together with the new unit, will total more than 450 tons.

The three furnaces being modernized were built by Rust originally and put in operation in 1938. During the war they were operated at a maximum of 90 tons per hour, 50 per cent above the design capacity. Their redesign, scheduled to be completed in late spring, permits larger heat input and includes improvements that increase the capacity of each to 115 tons.

Metalworking Wages 40% of Factory Total

NEARLY 40 per cent of all wages and salaries paid to employees in the manufacturing industries in 1946 were paid by the iron and steel industry and its principal customers. The total of wages and salaries paid by the companies which make iron and steel and the companies which fabricate ferrous metals into end-products was $14.1 billion, 39.2 per cent of the $36 billion paid workers in all manufacturing industries.

The primary steel industry, including producing and rolling mills and certain manufacturers using iron and steel, accounted for $4.5 billion of the 1946 total, according to a study by the American Iron & Steel Institute of data compiled by the U. S. Department of Commerce. Steel consuming firms paid wages and salaries as follows: Machinery (except electrical), $3.9 billion; electrical machinery, $1.9 billion; makers of transportation equipment, including automobiles, $3.7 billion.

Central States Lead — Payments by the steel producing and fabricating plants went to employees in 44 states and the District of Columbia. The impact of these payments was felt most strongly in the Central States, where employees in steelmaking and fabricating plants received $6.96 billion in wages and salaries. This area includes Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio and Wisconsin.

The second most important area was the Middle Eastern section of the country which accounted for $3.99 billion in such wages and salaries. The bulk of these payments was made by establishments in Pennsylvania, New York and New Jersey, with relatively smaller payments made in Maryland, West Virginia, Delaware and Washington, D. C.

Payments in other areas were: New England, $1.3 billion; the Far West, $1.0 billion; the Southeast, $0.48 billion; the Southwest, $0.20 billion; the Northwest, $0.13 billion.

CIO Retains Demands For Wage Advances

That the Congress of Industrial Organizations will continue to press for substantial wage increases this spring, despite the recent decline in commodity prices, was reiterated last week by President Philip Murray.

Mr. Murray said the drop in food prices was "in the best interests of the American people as a whole" but that the CIO still would demand further wage increases and the enactment of an effective anti-inflation program.

"Nothing that has occurred in the past few weeks alters the CIO's determination to pursue these objectives.

"We believe that the inflationary factors which existed a few months ago to a large extent exist today. The demand for steel and consumer goods remains high. The prospects for the Marshall Plan expenditures indicate that our export balance may be almost as high as it was at the peak in 1947. The underlying position in agriculture still remains strong."

PENSION FUND

Presidents of five General Motors locals of the United Automobile Workers have come up with a proposal that General Motors Corp. should set aside $15 for each car and truck manufactured to be applied to a pension fund for its union employees.

UAW Opens Campaign for Western Aircraft Workers

A campaign to bring all West Coast aircraft workers into the United Automobile Workers-CIO has been opened under the direction of Roy Reuther, brother of Walter Reuther.

Immediate goal is to win bargaining rights for the 8000 production workers at Consolidated Vultee Aircraft Corp.

Triple Alloy Steel Output Substantial

Of all alloy steels produced since the war ended, it is estimated about one-eighth of the total were "NE" or National Emergency steels, which were originally developed under emergency conditions during the war to conserve critical alloying elements, the American Iron & Steel Institute reports. Some of these steels have proved highly useful for peacetime purposes and remain in demand.

The NE steels, now known as triple alloy steels, have been standardized by the American Iron & Steel Institute and the Society of Automotive Engineers.

Freight Car Output Seen Up in March

INDICATIONS are that in March for the first time since early last year when the 10,000-unit monthly goal was set up for freight car builders and railroad car shops that total of new freight cars will actually be built. Office of Defense Transportation officials predict March totals will meet the target, and April's total will exceed this figure.

Hampered by shortages of steel and gas, beset with labor difficulties and slowed by extremes of temperatures last summer and this winter, the builders have tried vainly to meet their schedules. February's total is expected to be under 8000. In the first 15 days of the month 3931 freight cars were built.

Making Up Losses—Builders now are working to overcome some of the production losses suffered recently. Pullman-Standard Car Mfg. Co., Chicago, for example, operated its facilities a week ago Saturday and again on Monday, a holiday, and hoped to turn out 2500 freight cars in February, compared with a usual output of 2000.

In January 8949 new cars were put into service by railroads. December's total, the highest reached so far, was 9883 cars.

Deliveries in November, December and January have exceeded retirements by 10,034 cars, according to Association of American Railroads, with January showing 3876 more cars put in service than were retired.

Union Shop Chosen in 99 Per Cent of Polls

Demands upon the services of the National Labor Relations Board and its general counsel jumped 45 per cent in January, although many unions still are not qualified to request its help.

The monthly report of the NLRB, which administers the Taft-Hartley Act, shows that an unprecedented 3008 cases were placed before the board in January. Elections of various types were sought in 2685 of these cases, most of which were filed by the unions.

The report shows that in elections held on the union shop issue, as provided in the Taft-Hartley law, the union shop was approved in 99 per cent of the polls.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Complicated system of checks and double checks that must be observed in government procurement, as well as legal red tape, explains slowness of decisions

IF MANY people wonder why it is that transactions which can be put through in a hurry in private business often drag out over many months when the government is a party, they can be assured that there is a good reason. This is the large amount of legal red tape, with its complicated system of checks and double checks, which has to be observed in government procurement.

Government people are the same as other Americans, and like to get things done—but they have learned by bitter experience that when they succumb to the temptation of making quick decisions they are likely to find themselves way out on a limb.

Those who act without a thorough study of the laws, or who fail to consult with other interested agencies, are apt to find themselves in trouble. In particular, dat ole debbil GAO (general accounting office) is apt at any moment to spring out unexpectedly and strike unwitting offenders.

Red Tape Delay—There are plenty of instances each week of delayed action resulting from red tape. For example, early last summer Congress authorized the Federal Housing Administration to insure bank loans to manufacturers of prefabricated housing. Anyone wondering why the first such insurance contract—covering a loan by The Trust Co. of New Jersey, Jersey City, N. J., to The Housemart Inc., Cleveland—was not finalized until Feb. 12, 1948, has only to read Section 609, Title VI, of the National Housing Act. Here is a case where the legalistic requirements almost nullified the intention of Congress to help relieve the housing shortage while housing is still short.

Perhaps the best present example of the treatment that awaits government officials who make quick decisions is afforded by the current hearings of the Subcommittee on Procurement and Buildings, House Committee on Expenditures in the Executive Departments, chairmanned by Rep. George H. Bender (Rep., O.). This subcommittee is examining GAO's charges that the Reconstruction Finance Corp. conducted itself in an irregular, inefficient and irresponsible manner. It is about the 10th congressional committee to investigate the RFC over the past year. Others have been the Senate War Investigating Committee formerly headed by President Truman, the two Appropriations Committees, the two Small Business Committees, and others. The Bender subcommittee in particular is investigating charges against the Defense Plants Corp., now RFC's Office of Defense Plants.

MORE COMPANIES

Net increase of 200,000 in the number of concerns in existence brought the country's business population to 3,870,000 in operation at the end of 1947, according to the Department of Commerce.

This figure exceeds the prewar peak of September, 1941, by 470,000 and the wartime low of December, 1943, by 1 million. Although business activity increased greatly during the war, the number of business firms dropped by nearly 600,000. This deficiency was eliminated entirely in 1947.

However, the rate of increase in firms declined progressively throughout 1947, the report adds, reaching about 40,000 per quarter at the year's end as compared with 107,000 per quarter in 1946.

Few Plants Involved—The GAO must have used a strong magnifying glass in formulating its charges of bad management practices, for they involve only 17 of the 2194 plants financed by the DPC during World War II.

On the basis of its findings in these 17 cases, the GAO charged that in financing war plants the DPC allowed the sponsoring agencies—War Department, Navy Department, War Production Board, Maritime Commission, etc.—to make many of the management decisions.

"As a result," says the GAO report, "resources of RFC were placed, without proper accountability, at the disposal of other agencies. We doubt that RFC would have accepted the full financial hazard in these cases had its management not felt that the financial responsibility was primarily that of the agencies under whose directives it was operating. Hence RFC accepted unwarranted risks of financial loss."

RFC's rejoinder is that management deficiencies must be attributed to the urgency of the war effort and to the great need to get the job done irrespective of cost or other normal considerations. In fact, James L. Kelehan of the Office of Defense Plants expressed the view to the Bender group that the DPC was merely the financing and servicing agency in following out the directives of the government's various sponsoring agencies.

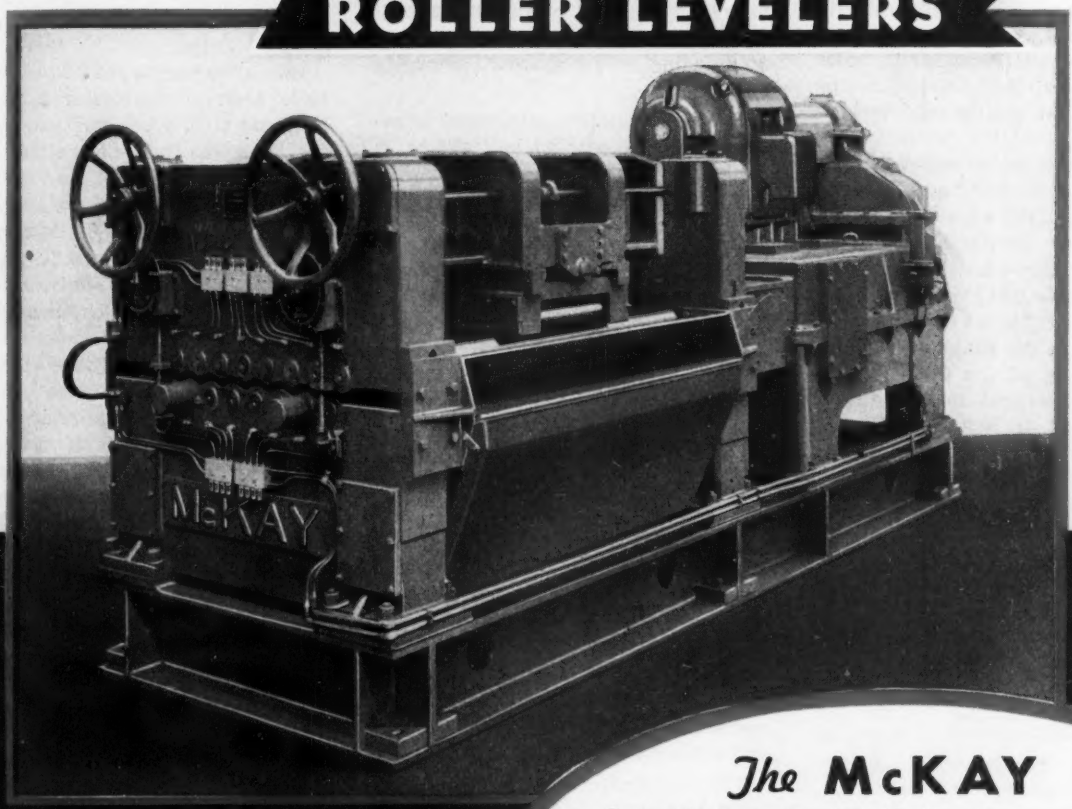
Responsibilities Clear—"The obligation and responsibilities of the sponsoring agencies were so clearly understood by the DPC and such agencies that there was no reason to establish a written record in each instance as to the respective obligations and responsibilities. DPC did not undertake to review the determinations, recommendations and directives of the sponsoring agencies, or to assume responsibility for setting up the various programs of industrial expansion or the selection of the operators or lessees of the various projects, or the process to be used . . . The fact that DPC was merely a financing and servicing medium for the sponsoring agencies and acted on the recommendations and directives of the sponsoring agencies was well known to Congress during the war period."

As to the Andrews Steel Defense Corp., about which the subcommittee specifically inquired, Mr. Kelehan added, the House Appropriations Committee of the 77th Congress was thoroughly informed about this case when it was considering the Military Establishment Appropriation bill. It was simply a case of honoring a request of the War Production Board for financing that would keep the Andrews Steel open hearth plant producing ingots for badly needed steel for 8-inch shells. The company had decided that because the severe operating losses—even after the OPA had authorized it to get $52 for its ingots as against the ruling price of $40—it would close down its open-hearth furnaces.

At WPB insistence, said Mr. Kelehan, the DPC executed on June 23, 1944, a lease and operating agreement between DPC and Andrews Steel. This continued in effect to Sep-

McKAY

BACKED-UP ROLLER LEVELERS



FEATURES

mpact design reduces required or space.

l adjustments are readily ac- ssible to the operator.

curate indicating dials are pro- ded for the screwdowns.

Alloy steel Helical gears are used throughout — fully enclosed and running in oil.

Drive is through Universal couplings.

One-shot lubrication system.

Rugged construction insures continuous performance and low maintenance cost.

The McKAY

Backed-Up Roller Leveling Machine has extraordinary rigidity because its small diameter work rolls are supported by backing-up rolls. This type of leveling works the sheet more thoroughly.

Sheets processed on this type of leveler are strain relieved to a greater extent and have far superior stamping and drawing qualities than those processed by the ordinary leveler.

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tember of 1945. The deal cost the government $13,730,579.84 which included management fee of $395,976.69. Net loss to the government was $2,705,787.82, despite the $52 price on the ingots. The management fee, Mr. Kelehan explained, was on the basis of $1 per ton of steel produced. DPC spent, out of its own pocket, $310,000 in rehabilitating the plant, and received no consideration for this expenditure. DPC purchased inventory at the steel plant at the cost-figure total of $800,000 while, at conclusion of the arrangement, it sold to Andrews at $316,000 an inventory that cost $791,000.

Objected Strenuously—"Our objection to the terms of this arrangement were very strenuous," said Mr. Kelehan, "and we tried, without success, to make a contract more favorable to the government. In the end we met the Andrews Steel demands in order to get the added steel production the War Production Board said was so essential."

The other 16 cases in which the GAO criticized the RFC and DPC for sloppy management (the GAO report makes it clear that the names are used entirely for identification purposes and "their use is not to be interpreted as a criticism of those companies or of their managements") included financing of the following facilities: Basic Magnesium Inc. (manganesium plants); Benjamin Franklin Graphite Co. (graphite plant); Brewster Aeronautical Corp. (aircraft); Continental Ordnance Corp. (steel foundry); Foote Mineral Co. (lithium salts plant); General Electric Co. (capacitors for public utility companies); Humble Pipeline Co. (pipeline); Kaiser-Hughes (Hughes Tool Co.) (cargo aircraft); Lake Washington Shipyards Co. (shipbuilding); Mathieson Alkali Works Inc. (magnesium plant); Pacific Exploration Co. Inc. (operating fishing vessels); Pratt & Whitney Aircraft Corp. of Missouri (aircraft engines); Severance Tool Industries Inc. (tool production and servicing); Springfield Machine & Foundry Co. Inc. (production of milling machinery); Threadwell Tap & Die Co. (cutting tools); and Union Sulphur Co. Inc. (natural gas transportation).

Whether the Bender subcommittee will examine into each one of these cases individually remains to be decided. Inasmuch as no criminal charges are involved, about all the subcommittee could do on conclusion of the investigation would be to caution the RFC against future carelessness in exercising its managerial functions.

Concludes Investigation — In the meantime, another congressional group has just concluded a separate investigation of RFC; this is the Buck subcommittee of the Senate Banking & Currency Committee which has voted 5—0 for continuance of the RFC, but with severe operating and capital restrictions. The subcommittee, instead of letting RFC expire this coming June 30 would continue it to June 30, 1958, with two additional years for liquidation. It would cut RFC's capital from $875 million to $150 million, the difference to go toward debt reduction.

The subcommittee voted to require RFC to charge interest on its loans that would enable it to be self-supporting (RFC since its establishment in 1932 has cleared a profit of $570 million even though no law required it to do so); and it set a ceiling of $1 billion on total commitments outstanding at any one time. At present outstanding commitments come to $1.3 billion.

The subcommittee also voted to restore RFC's power to buy stocks in banks and insurance companies when the secretary of the treasury certifies that these institutions need funds. Also, to reduce from 90 to 50 the percentage of bank loans that the RFC can guarantee—excepting that a guarantee of as much as 65 per cent would be permitted on small loans involving less than $100,000.

Government Personnel Cut

Net reduction of 8054 in the overall personnel ceiling for the executive branch of the federal government for the fourth quarter of the fiscal year 1948 has been announced by James E. Webb, director, Bureau of the Budget. The reduction was effected despite normal upswings in seasonal activities in the Departments of Agriculture and Interior and other field services.

The new total ceiling for the three-month period beginning Apr. 1, 1948, is set at 1,907,577. The maximum ceiling figure for the third quarter of the fiscal year 1948, which began Jan. 1, was initially set at 1,914,814. Subsequent revisions increased this figure to 1,915,631. These figures exclude practically all employment in foreign countries.

Twenty agencies are allowed increases amounting to 21,405 for their fourth quarter ceilings. Decreases in other agencies total 29,459, making a net decrease of 8054 in the total ceiling for the fourth quarter. Principal decreases in agency ceilings are: Department of the Navy, 5265; U. S. Maritime Commission, 8570; Veterans' Administration, 6838; and War Assets Administration, 6517. Among the agencies receiving increases are the Department of Agriculture (seasonal), 12,327; Department of Commerce (CAA activities); 1257; Department of Interior (seasonal), 5735.

Statistical Plan Scrapped

As part of its effort to prune government expenses, the House Appropriations Committee has decided against a request of the Federal Trade Commission to broaden its statistical service. At present the FTC issues a report each quarter showing, in 22 industrial breakdowns, the quarterly financial showings of all United States manufacturing corporations. The House committee has decided to let the commission continue with this chore—but not to allow it to go any further during the fiscal year ending June 30, 1949.

One of the scrapped projects would have been of particular interest to iron and steel producers and consumers. This was to be an Annual Financial Summary for the Iron and Steel Industry, and was to have been broken down into some 100 classifications —such as steel rolling mills, gray iron castings producers, malleable castings producers, steel castings producers, merchant blast furnaces, tin can manufacturers, hardware manufacturers, heating apparatus manufacturers, etc. The commission planned, following publication of the annual iron and steel financial summary, to insure separate amplified reports for each industry listed in the breakdown.

This plan now is dead in the House, unless the Senate, when the Federal Trade Commission appropriation comes up in conference, insists on its retention. In view of the fact that Senate leaders are trying to find ways and means of reducing expenses and reducing the income tax load on individuals, the likelihood of such action is considered remote.

Six Agencies Change Names

Six branches of the United States Department of Labor have been given changes in titles to promote uniformity in nomenclature. The affected branches are: Division of Labor Standards changed to Bureau of Labor Standards; Apprentice Training Service to Bureau of Apprenticeship; Veterans' Re-employment Rights Division to Bureau of Veterans' Re-employment Rights; Office of Chief Clerk & Budget Officer to Office of Budget & Management; Office of the Director of Personnel to Office of Personnel Administration; Office of the Director of Information to Office of Information.

Scrap Importation Facilitated

Senate Small Business Committee prevails on customs office to relax regulations to permit clearance of one million tons from China for delivery to Bethlehem Steel

ONE million tons of scrap material recovered from Chinese and Pacific war areas have been cleared for delivery to the Sparrows Point, Md., plant of Bethlehem Steel Co. through efforts of the Senate Small Business Committee, Sen. Edward Martin (R., Pa.), Steel Subcommittee chairman, reported last week.

With three cargoes of the scrap material actually enroute, Bethlehem officials, faced with an unexpected customs bottleneck, asked the assistance of the committee.

Required Classification — Because the scrap also includes obsolete motors, buckled bulldozers and other equipment picked up in their original state from Pacific war areas, customs officials were requiring that the scrap be classified upon arrival, and held in bonded warehouses until the steel company actually scrapped it.

A further complication was also seen in the fact that customs officials might determine that some of the items were not scrap, and that a duty should be levied. Customs regulations define scrap as "second hand or waste or refuse iron or steel fit only to be remanufactured." Material so defined is not dutiable.

"The Bethlehem Steel Co. has purchased this material to be converted into scrap for steel production," Senator Martin said. "The scrap was originally sold to the Chinese government under one of many bulk sales agreements entered into by the U. S. Foreign Liquidation Commission, immediately following the war. The Chinese are now offering the scrap for commercial recovery, for the most part just as we left it on the islands of the Pacific."

Relaxation Secured—The Steel Subcommittee in co-operation with the Office of the Assistant to the President, John R. Steelman, has secured a relaxation of the customs ruling to permit Bethlehem Steel to bring the scrap directly to its plant. Letters have been exchanged between Mr. Steelman's office and that of the secretary of the treasury requesting this consideration, which would also establish a precedent for other and future commercial recoveries of scrap from foreign areas, Senator Martin said.

It is the understanding of the committee that Bethlehem Steel will be required to certify that all of the ferrous material which it has purchased will be converted into scrap for the manufacture of steel, and will execute a bond assuring conversion.

The recovery of scrap urgently needed for steel production has been a major objective of the Steel Subcommittee in its investigation of steel shortages. Legislation to expedite the recovery of scrap from government surpluses and installations, both in this country and in foreign areas, was introduced by Senator Martin on Feb. 2 (S.2109). It is now in the Banking & Currency Committee.

SCRAP FROM ITALY

Army officials in the European Command have advised the Department of the Army the first 3500 tons of ferrous scrap sold last year to the Canterbury Corp. will be returned to the United States. The announcement said the Liberty ship "Punta Alice" after loading the scrap at Genoa, Italy, sailed from that port for Philadelphia, on Feb. 23. A second shipment of 4000 tons will leave Genoa early this month. The scrap metal was removed from the United States Occupied Zone in Germany to Italy and prepared for transshipment to this country.

Small Business Protests Foreign Steel Shipments

The National Federation of Small Business has protested to the Commerce Department the "deplorable situation" in permitting steel shipments to foreign countries while small businesses in the United States are severely handicapped by inability to obtain sufficient steel supplies.

In a letter to W. Averell Harriman, Secretary of Commerce, George J. Burger, in charge of the Washington office of the federation, declared foreign shipments of steel are causing "considerable alarm" among the nation's small business men. As an example, he cited approval by the Commerce and State Departments of two steel shipments of 34,950 tons to Greece, and another of 550 tons to Iceland.

German Scrap Poses Problems

GERMANY is the potential source of as much as 10 million tons of scrap, but, according to preliminary reports of a special American committee investigating the situation, at least a year will be required before supplies can be brought out in quantity.

John L. Haynes, chairman of the U. S. scrap iron and steel mission to the American and British zones, asserted the war-wrecked industrial areas of Germany could provide enough scrap to make an "immense difference in the world steel situation" if the scrap could be moved.

Dealers Unwilling To Sell—Principal stumbling block preventing tapping this vast scrap reservoir is the reluctance of German dealers to sell under prevailing conditions. At present, materials exported by Germans are paid for in dollars which go into the joint export-import account of Bizonia to be used in payment for raw materials needed by the Germans, but German exporters continue to be reimbursed in reichsmarks, which are regarded as practically worthless.

Another bottleneck is the lack of cutting and processing equipment for scrap preparation. The committee at one time discussed the feasibility of organizing an American government-industrial corporation to bring in the necessary equipment and organize the scrap processing.

Still another hindrance is manpower, with scrap workers now receiving insufficient food to perform their jobs, the commission reported.

British Output Threatened—British experts surveying the situation see their own steel production seriously affected unless the Germans can be persuaded to sell. According to British estimates, 800,000 tons of scrap have already been collected in German yards and are ready for shipment, but even the British offer to pay prevailing Pittsburgh prices for the material has met with only limited success.

It is the belief of some authorities in Berlin that a large-scale export program can succeed only if sufficient inducements are offered. These might be in the form of food and clothing.

British Steel Needs in 1948 Exceed Supply

LONDON, ENG.

TO MEET all essential demands in 1948, Britain would require between 15,250,000 and 15,500,000 tons of steel ingots and castings. Latest estimates place maximum supply at 14,500,000 tons—14 million from home production and 500,000 from imports. Steel therefore now takes the place of coal as the major British production problem.

At the same time, performance in the 1948 steel production program also becomes a matter of concern to many other countries. If the output target is not reached, exports of capital goods, engineering products, and finished steel may have to be reduced.

Outlook Brighter — British steel production prospects are brighter now than they were a few months ago, mainly because of improvement in supplies of scrap and coke, but it is well to remember that the 14 million-ton rate set for this year is not only 12½ per cent above the actual production of 1947, but it is more than 750,000 tons greater than the alltime record output of just under 13,250,000 tons reached in 1939.

Translating these figures from ingot steel and castings to finished steel for which somewhat more than 1 1/3 tons of ingot steel are required per ton, Britain's 1948 budget of 14,500,000 tons of ingots will become 10,500,000 tons of finished steel. As needs for all essential purposes including 1 million tons for export, have been estimated at 11,500,000 tons of finished, there will be a shortage of 1 million tons. By eliminating the export tonnage, all home fabrication demands could be met, but that would be far from good business for Britain.

British authorities know that steel is not only an essential bargaining agent in foreign trade negotiations but it is a vital material in building up the buying power of overseas customers. With a million tons of finished steel going for export, the home allocation will be around 9,500,000 tons, or about one-fifth more than the 8 million tons, so allocated in 1947. From the 1948 total, something like 2 million tons will be used in the manufacture of vehicles and other finished products for export.

Key Industries Aided—The revised scheme of allocation coming into effect in the second quarter of this year aims at insuring the best use of limited output. At present, prospects are that the key industries will get allocations as follows: Engineering and vehicles, somewhat more than last year; consumer goods, a little above 1947; agricultural machinery, a very substantial increase; railroads, an important addition; electricity, a very substantial gain over last year; coal mines, a useful increase.

On the other hand, certain industries will suffer cuts, such as: Factory and government building, two-fifths reduction; shipbuilding, one-fifth reduction; the gas industry, a little less than in 1947.

Even with these adjustments the prospect, is that, unless there is a considerable spurt in output of ingot steel or substantial supplies under the Marshall Plan, cuts in the export targets of industries using steel may be necessary.

TRACTORS FOR POLAND: Shipload of farm tractors, shown at Philadelphia dock, will be shipped to Poland as part of the campaign to relieve the food shortage on the continent. Tractors are equipped with Goodyear tires. NEA photo

Belgians Push Trade, Output Up

LIEGE, BELGIUM

EXCEPT for temporary cancellation of shipments to France when the French franc was devaluated, Belgian export trade continues on a satisfactorily high level. Deliveries were resumed as soon as the situation with regard to the franc was clarified.

Generally speaking, however, Belgian exporters are more interested in sales to South America and other countries where payment can be made in hard currency. Surveys to determine the market potential for steel products in the newly created country of Pakistan are being undertaken with this in mind.

On the domestic scene, business is brisk with transportation industries striving to rehabilitate their equipment and restore traffic to its prewar status.

The Societe Nationale des Chemins de Fer Belge has received an order for 50 cars, which will be used in trans-European service and a contract has recently been placed in Belgium for repair of 140,000 German railroad cars.

The Liege-Antwerp canal, which up to now has been a bottleneck to larger ships, is to be widened, to the benefit, particularly, of the Liege district where the bulk of the country's steel industry is located. Improvement of this water route is expected to facilitate trade with the other Benelux nations—Luxemburg and the Netherlands.

Postwar Records Set—Production of iron and steel is being well maintained at levels higher than in 1938 and December's output was the highest attained since the war. Total 1947 production of steel ingots and castings was 2,891,000 metric tons, compared with 2,284,000 tons in 1946. Pig iron production last year was 2,820,000 tons, compared to 2,171,000 in the previous year, and 2,382,000 tons of finished products were made.

against 1,815,000 tons in 1946.

The shortage of foundry pig iron in Belgium is still serious. Pig iron requirements are from 15,000 to 20,000 tons a month, but during the last eight months of 1947 only three blast furnaces were making foundry iron and their aggregate production was about 8300 tons a month, with the result foundries have had to use large tonnages of scrap in their melts. Foundry iron from a new blast furnace, soon to be put in operation in Luxemburg, plus imports from the Netherlands likely will boost monthly tonnage available to foundries to 18,000 tons.

Belgian Costs Scrutinized—Analyzing the cost price of Belgian rolled steel, P. Gillain, director, Thy le Chateau iron and steel works, has calculated that raw materials account for 33 per cent, fuel for 25 per cent, wages and overhead for 25 per cent and transportation charges for 17 per cent.

Raw materials and fuel are said to cost more in Belgium than in Great Britain or in the United States, because iron ore must be bought in the open market as the country has no interest in ore mines presently, and because coal costs about $20 per ton compared with $12 in Britain and $10 in the U. S. These disadvantages are more pronounced because with the current lack of scrap most Belgian steels are made directly from ore and more fuel is required. With regard to wages, Belgium, Great Britain and the U. S. are about on a par, taking into account output per man to reconcile discrepancies in pay rates. In transport, Belgium has an advantage over the U. S. because of the smaller distances involved.

Steel Exports to Greece And Iceland Arranged

Completion of arrangements for export to Greece of 34,950 tons of finished and semifinished steel products has been announced by the Office of Materials Distribution, Department of Commerce. Similar arrangements also have been made for shipment of 550 tons of steel products to Iceland.

Bulk of the steel will consist of flat-rolled products, including plates; semifinished (billets) and bar products, including wire rods. Shipments are expected to begin within 30 to 60 days after orders and full details are filed with participating steel mills, and to be completed two or three months later.

Frank T. McCue, who served as government presiding officer at the industry committee meetings, stated orders would be spread over 29 steel mills in various areas.

French Aim at Fiscal Stability

Devaluating franc, setting up free money markets, invalidating 5000-franc notes and reopening Spanish border seen moves to expand exports and fight inflation

PARIS, FRANCE

THREE financial measures taken by the French government in February are expected to help win the fight for economic stabilization. These measures are aimed at increasing France's export trade, attracting tourists and combatting the black market.

Most important of these actions was that devaluating the franc to an official parity of 214 to the dollar. Establishment of free markets in dollars, Portuguese escudos and gold then followed the initial action, and the government simultaneously invalidated all 5000-franc banknotes, representing 37 per cent of the nation's currency.

As a further move to widen France's trade and remove the abnormal situation created in 1946, the border between Spain and France has been reopened, and an understanding between the two countries now provides for movement of goods in transit through both. The new regulations will facilitate exchange of food stuffs and ores from Spain and will open a new market for French goods.

Electricity More Plentiful — One commodity which France expects to be able to export in quantity this year to Spain, Switzerland and Italy is electricity. Mild weather this winter has brought more than normal rainfall, with the result hydroelectric power installations have been able to increase their production. At present 6 million kilowatt-hours more than in January, 1947, are available, and in Paris the electricity allocation has been raised by the improved situation.

Production of pig iron in December amounted to 370,000 tons, compared with 385,000 in November. Steel ingot and casting output was also reduced during the month to 408,000 tons, against 409,000 in November.

World Trade Reviving Is Chicago Conference View

World trade is slowly but surely recovering despite dollar shortages, currency difficulties, market dislocations and uncertain production. This was the consensus expressed at the 12th annual Chicago World Trade Conference at Hotel Sherman recently, a meeting sponsored by Chicago Association of Commerce & Industry and Export Managers Club of Chicago.

American exports of goods and services in 1948 are expected to total $18.5 billion if the European aid program is adopted. This would compare with trade amounting to $19.5 billion last year.

BRITISH INGOT OUTPUT AT NEW HIGH IN JANUARY

AN ALLTIME record annual rate of steel production was set by the British industry in January, according to British Iron & Steel Federation. Weekly output at 280,600 tons was equivalent to annual production of 14,589,000 tons, which compared with the annual rate in December of 12,646,000 tons and 12,470,000 tons in January, 1947. Pig iron production was also up, the January rate being equal to 8,726,000 tons on a yearly basis compared with 8,561,000 tons in December and 7,806,000 tons in January, 1947. Details of production rates in tons are shown below.

STEEL INGOTS AND CASTINGS

	1947		1946	
	Weekly Average	Annual Rate	Weekly Average	Annual Rate
November	272,600	14,174,000	263,800	13,715,000
December	243,200	12,646,000	236,300	12,289,000
4th Quarter	263,100	13,679,000	251,700	13,088,000
	1948		1947	
January	280,600	14,589,000	239,800	12,470,000

PIG IRON

	1947		1946	
	Weekly Average	Annual Rate	Weekly Average	Annual Rate
November	165,900	8,617,000	153,900	8,002,000
December	164,600	8,561,000	153,200	7,966,000
4th Quarter	163,600	8,505,000	154,400	8,029,000
	1948		1947	
January	167,800	8,726,000	150,100	7,806,000

new Bullard type "K" economies widen scope of MULT-AU-MATIC method

Higher Speeds Meet New Job Requirements. Designed to lower production costs of small and medium sized jobs in cast iron, steel and light metal alloys, the new BULLARD Type "K" Mult-Au-Matic provides a wide range of spindle speeds up to 900 rpm to get full productive capacity out of modern cutting tools.

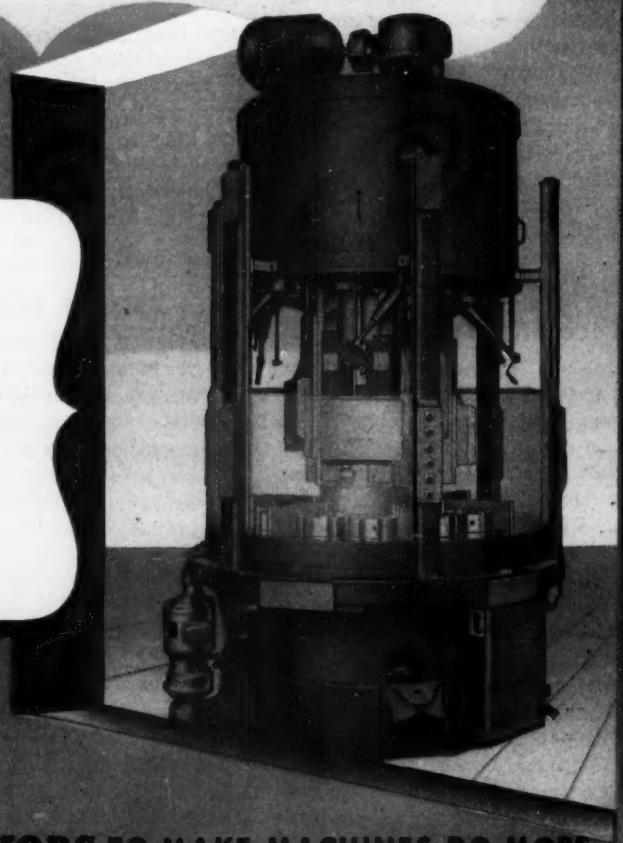
Saves Time Between Cuts. A newly developed index control mechanism permits faster return and advance of tool carrying heads and faster carrier index.

Higher Degree of Accuracy. New method of carrier index registry maintains repetitive accuracy from station to station, producing work to extremely close tolerances.

Improved Hydraulic Chucking Increases Efficiency. Work is chucked quickly by foot treadle control and automatically released as spindles return to loading station. Chucking pressure is adjustable to suit work characteristics.

Twin Spindles Double Production. Two of the four Type "K" models have twin spindles that deliver two finished pieces for every index cycle . . . a promise of lower production cost that is worth investigating further.

Write for complete information about the new Type "K" version of the Mult-Au-Matic method, one of the leading contributors to our modern American production system. THE BULLARD COMPANY, Bridgeport 2, Connecticut.



BULLARD Type "K" Mult-Au-Matics for work up to 10" in diameter come in four models: 6 or 12 spindles with speeds from 100 to 900 rpm, and 8 or 16 spindles with speeds from 98 to 880 rpm. 41 speed changes, 82 rates of feed, selective feeds and common speeds at all stations.

BULLARD

BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Chrysler earns 4.93 per cent of sales in 1947, compared with average of 5.82 per cent in prewar history. Corporation sees depreciations charges as inadequate

DETROIT

AMID ALL the hue and cry over corporate profits, price increases and the like, it is pertinent to take a typical case and "look at the record" as a well known politician used to suggest. Chrysler Corp., long held to be one of the most profitable automotive manufacturing properties, in 1947 sold $1,362,626,751 worth of automobiles, trucks, parts, accessories and other miscellaneous products. Total U. S. and Canadian sales of cars and trucks came to 1,005,566 units, which realized net earnings of $67,181,221 or the equivalent of 4.93 per cent of sales, comparing with an average of 5.48 per cent earned during the five prewar years, and an average of 5.82 per cent of sales earned during the peacetime period from the first year of the corporation's history to the beginning of the last war, or 1925-1941.

Depreciation Allowances Inadequate—Such a profit is no great shakes but is perhaps commensurate with the big three in the automotive industry. The interesting thing about the twenty-third annual report of Chrysler, however, is the appended comment on depreciation charges. Under the signature of K. T. Keller, president, it is observed that "the inflationary cycle in which it appears our economy is currently involved presents all industry with a long-term financial problem which it is difficult to appraise at this time, and even more difficult to reflect properly in short-term annual accounting. Just what the eventual cost of replacing facilities now in use may be when the necessity for such replacement develops is obscure. Government indexes show that industrial building construction costs have risen during the past year 14 per cent and since 1939 have risen 83 per cent. There have also been substantial increases in the prices of machinery and equipment. The level at which prices may eventually stabilize is, to say the least, uncertain."

In the calm logic of the annual corporate report, this is putting it mildly. What bothers the accountants is that if the current high level of prices continues to prevail, the depreciation charged to income in 1947 and prior years in accordance with current accepted accounting principles on the basis of original actual costs will be entirely inadequate to provide for the ultimate replacement of plants and facilities as they wear out or become obsolete.

Replacement Costs Up—As Chrysler puts it . . . "The original cost of all buildings, machinery and equipment now owned and used in operations was better than $210 million. It is estimated that their replacement at today's price level would cost $352 million. Against this eventuality to date there have been accumulated depreciation reserves of $130,513,952. Accumulated depreciation reserves are considered by the management to be adequate in relation to original costs but fall far short of representing an adequate accumulation to cover the cost of their replacement at inflated prices. If present price levels continue or rise, it is apparent that the ultimate replacement problem can only be met, without resort at some time in the future to capital financing, by accumulating cash balances from current operations. Your management has this firmly in mind in determining fiscal policies, but as yet no method of dealing with this matter in corporation accounting reports seems to have been devised and accepted into common practice."

In essence this is a problem which all large corporations are facing. Chrysler has decided to modify its depreciation policies by accelerating charges for the early years of productive use of facilities acquired since the war, amortizing on a short-time basis the excess cost of such acquisitions over prewar price levels. The effect was to increase 1947 depreciation charges by better than $5.1 million, resulting in a total charge for the year of nearly $13.6 million. And this in spite of the fact no major changes in passenger car models have been effected since the 1941 versions.

Chrysler now has in the works a large-scale model change for all of its cars and the effect on 1948 balance sheets doubtless will be staggering. Small wonder that all motor companies have been and are viewing capital expenditures with a questioning eye, convinced that they are venturing into uncharted financial waters.

Chrysler May Be Target—Meanwhile the UAW-CIO locals in Chrysler plants have decided to ask for a wage raise of 30 cents an hour plus a health insurance plan, an "adequate" pension plan, a guaranteed weekly wage and an increase in vacation allowances. It appears Chrysler will be the opening target in the union's 1948 wage drive, following behind-the-scenes pleas from UAW groups in General Motors plants not to subject them to the inherent danger of strikes to enforce wage demands. A 30-cent wage raise would bring the average rate from around $1.50 currently to approximately $1.80, or the equivalent of 20 per cent.

Paul Hoffman, president of Studebaker, recently declared that a "third-round" wage increase of 15 per cent would raise average production cost of his cars about $75 each, much of which would have to be passed on to buyers.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	442,930*	366,205
February	.....	393,636
March	.....	443,588
April	.....	445,137
May	.....	404,191
June	.....	421,466
July	.....	400,944
August	.....	364,478
September	.....	444,501
October	.....	461,536
November	.....	417,493
December	.....	492,109
12 mos.	.....	5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
Feb. 7	82,717	98,958
Feb. 14	83,996	97,276
Feb. 21	109,157	103,400
Feb. 28	112,000	105,175

Estimates by Ward's Automotive Reports

Cheaper Spring Steel

Considerable interest is being shown in automotive metallurgical circles in a new type of low-chrome

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NEW FORD PLANT: Lincoln-Mercury assembly plant of Ford Motor Co. at Metuchen, N. J., now under construction, will provide more than a half million square feet of floor space

molybdenum steel for a variety of applications. It has been developed as a less-expensive replacement for the S.A.E. 9260 type of spring steel, for example, and for the amola grades of steel, although the rapidly shifting picture on alloy extras clouds the economic aspect at the moment. However, the low-chrome molybdenum analysis runs 0.40-0.60 chrome and 0.08-0.15 molybdenum, with four carbon ranges proposed with the idea of making it an all-purpose type. Thus, the 0.20 carbon would be a carburizing analysis for ring gears and pinions, the 0.30 carbon would be a water quenching grade for such applications as steering knuckles, the 0.45 carbon an oil quenching type for transmission gears, and the 0.60 carbon for springs, the latter to supplant the siliconmanganese alloy.

S. A. E. 9260 steel now carries the alloy extra plus 95 cents per hundred, in contrast to 40 cents per hundred a few years ago. The increase has been occasioned by the higher cost of the silicon alloy and possibly by the fact steel companies do not particularly care to melt this analysis for reasons of control. Amola steel, the 4000 series, is used widely by Chrysler for springs and other constructional parts and carries the alloy extra plus 75 cents, which not too long ago was only 45 cents. The low-chrome molybdenum analysis, which it is proposed to locate in the 4400 series of S.A.E. steels—there being no such classification at the moment—carries the alloy extra plus 70 cents, or the equivalent of $1 per ton less than amola in the 4000 series.

Other than the economic advantages, the low-chrome moly steels appear to show appreciably better fatigue properties, on the basis of preliminary tests. Chevrolet, for example, ran fatigue tests on a series of seven springs, all of which withstood better than one million cycles, where the test was concluded. No other spring steels of any one analysis have shown such fatigue properties. Up to the present, no commercial heats of the 4400 series have been melted, except for a 100-ton open-hearth heat which one motor company has ordered from Carnegie-Illinois.

Every 5-cent reduction in alloy extra means a lot to automotive steel buyers, particularly if physical property advantages appear to go along with it. Hence the suggestion of one steel supplier that S.A.E. 5160 straight-chrome alloy, priced $1 a ton less than the low-chrome molybdenum, be considered for springs, holds out some merit. This analysis carries 0.70-0.90 per cent chrome and might conceivably carry a higher extra should the price of ferrochrome be boosted again, as some think possible. The entire alloy steel pricing picture at the moment is highly confused and subject to almost overnight change, but it is being watched carefully by cost-conscious automotive buyers.

Ford Moves to Ypsilanti

Manufacturing operations at the Milan and Phoenix, Mich., plants of Ford Motor Co. are being moved this month to a plant at Ypsilanti. The Milan plant makes ignition coils and employs 300. Operations there will stop March 12 and resume at Ypsilanti March 22. The Phoenix plant supplies voltage regulators and cutouts, with employment of 150. Closing there will be March 19 and resumption at Ypsilanti March 29. The latter plant is headquarters for the parts and equipment manufacturing division of Ford which, after the change this month, will include eight plants in Michigan and units in Hamilton, O., and Green Island, N. Y. The Ohio plant will be a source for coil springs to be used on new Ford models now in process of changeover. The Ford-Mercury-Lincoln passenger cars will have conventional types of leaf springs in the rear, coil springs in front.

Better than 1000 men are now engaged in moving heavy machinery and rerouting conveyor lines at the Ford plants, a job which is scheduled to be completed by April 1. Conversion projects are well under way in six buildings at the Rouge plant. Heavy machinery is being moved to new positions in the plastics building. More than 200 machines and presses are being moved from the Spring and Upset Bldg. to the new gear and axle plant in northeast Detroit. A new conveyor line for assembly of frames is under construction in the cold heading building at the Rouge plant, while more than 400 machines are being moved out of the old gear and axle building and 741 units rearranged within the building. Many presses are being shifted around in the large Ford stamping plant, while new final assembly lines for both Ford and Mercury are being installed in the so-called B building.

Shortage Hits Packard

Review of 1947 operations of Packard Motor Car Co. shows a production of only 55,252 cars as a result of "being hit harder by the steel shortage than any other company in the industry." However, the company has approximately $30 million in working capital, with no bank loans, preferred stock or bonds outstanding.

Light Metals in Autos

Experiments in substitution of light metals for steel in building Kaiser and Frazer automobiles were described by Clay P. Bedford, vice president in charge of manufacturing, Kaiser-Frazer Corp., before the Cleveland chapter of the American Society of Tool Engineers.

Aluminum gas tanks, die-cast magnesium wheels, doors of die-cast aluminum frames with steel skins and die-cast instrument panels are the most practicable applications in sight.

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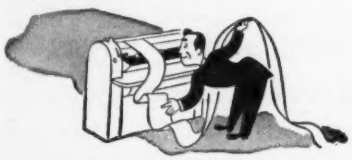

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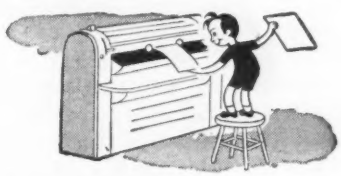

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Bearings Exports Climb in 1947

Overseas shipments, valued at nearly $26 million, more than doubled those in 1946. Industry can fill most foreign orders for the first time since 1939

EXPORTS of ball and roller bearings have more than doubled in dollar volume during the past year, and for the first time since 1939 the industry is able to fill a major share of foreign orders without sacrifice to domestic needs, George Carleton, president, Anti-Friction Bearing Manufacturers Association, New York, reported last week.

During 1947, Mr. Carleton said, U.S. ball and roller bearing manufacturers shipped abroad nearly $26 million in completed assemblies and parts, amounting to more than 11 per cent of total production. During 1946, when the industry was straining its production facilities to meet domestic demands, export business amounted to less than 5 per cent of the total, or $11,164,781.

Bearings Essential—"No large scale or effective industrial recovery in Europe or Asia is possible without substantial supplies of ball and roller bearings to start factory wheels turning," Mr. Carleton said.

"Although both England and Sweden continue to be important bearing producers, the task of meeting world-wide demand has fallen on the shoulders of U.S. ball and roller bearing manufacturers, and the demand will increase as European industrial recovery moves forward," Mr. Carleton pointed out.

Ten Nations Chief Buyers—At present ten countries are leading all others in the purchase of anti-friction bearings. They are Canada, Czechoslovakia, Sweden, United Kingdom, Belgium, Argentina, Switzerland, Brazil, Australia and the Netherlands.

With the exception of certain anti-friction bearings made from strip steel, now in short supply, delivery schedules on domestic bearing orders range from 60 to 90 days, Mr. Carleton pointed out. In many cases, orders for standard types of assemblies are being met out of stock for the first time since prewar days. Export delivery is now slightly above 1939 averages.

Flexible Tubing Corp. To Commence Operations

Flexible Tubing Corp., organized late in 1947, has just announced its entry into the flexible tubing field, with laboratory, design engineering and manufacturing facilities to be centered in Branford, Conn.

President and treasurer of Flexible Tubing Corp. is Frederick K. Daggett, former sales and engineering manager of Spiratube Division of Warner Bros. Co., Bridgeport, Conn. Secretary is Joseph B. Morse, New Haven attorney; and assistant treasurer is Alexander K. Murphy, formerly of New Haven Clock Co.

Board of directors consists of the following: Mr. Daggett; A. G. Newton, president of Rockbestos Products Corp. and chairman of the board, Silex Corp.; Joseph W. Powell Jr., vice president of American Research & Development Corp.; Dr. Arthur Bliss Dayton, New Haven physician and member of the board, Soundscriber Corp.; William G. Falsey, investment banker and partner in Charles W. Scranton Co.; Bruce Payne, president, Bruce Payne & Associates, management consultants; and Calvin D. MacCracken, president, Jet-Heet Inc.

Follansbee Buys Federal In Cash and Stock Deal

Follansbee Steel Corp., Pittsburgh, has acquired approximately 70 per cent of the outstanding stock in Federal Enameling & Stamping Co., McKees Rocks, Pa., by payment of $3,490,560 in cash for 51 per cent and a stock transaction involving five shares of Follansbee for each share of Federal for the remaining 19 per cent of the stamping company's stock.

Federal is a manufacturer of enameled ware and other domestic utensils and a user of cold-rolled sheet steel which is produced by Follansbee. There will be no changes in the management or policies at Federal, Lauson Stone, president and board chairman of the steel company, declared. C. E. Christman will continue as president and general manager, and he also will become a director of Follansbee.

C&O Begins $2,300,000 Expansion at Russell, Ky.

Chesapeake & Ohio Railway has undertaken a $2,300,000 expansion and improvement program at its Russell, Ky., yards. Program at this 855-acre terminal includes extension of present truck and smith shops; installation of new repair machinery, overhead traveling cranes and locomotive hoists; re-arrangement of repair yards; and many other projects.

McLouth Steel Buys 24-Inch Rolling Mill

McLouth Steel Corp., Detroit, has purchased a new 24-inch cold rolling mill to meet the increased sales demand on its stainless steel division.

The mill will be installed during the third quarter of this year.

NEW STAMPING CAPACITY: Recently completed addition to plant of Parish Pressed Steel Co., Reading, Pa., is shown above. The 250 x 520-ft brick and steel sash structure will house facilities for stamping 40,000 automobile frames a month. Plans are under way for a further addition of about 50,000 sq ft, also to be devoted to stamping automobile frames

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Department of State has announced no licenses shall be granted for the exportation of any arms, ammunition or implements of war which have been sold by the government as salvage or scrap.

—o—

Electric Storage Battery Co., Philadelphia, recently honored its 1000th employee to complete 25 years' service.

—o—

Chamber of Commerce of the United States, Washington, has published a booklet entitled "Analysis of Workmen's Compensation and Discussion of Coverages," designed to answer knotty questions confronting employers in connection with workmen's compensation coverages.

—o—

H. K. Ferguson Co., Cleveland, reports that construction has started on a chlorine plant for Delhi Cloth & General Mills Co. Ltd., Delhi, India.

—o—

War Assets Administration expects to close a lease soon on the $7 million magnesium plant at Mead, Wash., to Pend Oreille Mines & Metal Co. and Chromium Mining & Smelting Corp. which submitted a joint bid. Plant was operated during the war by Electro-Metallurgical Co.

—o—

U. S. Air Force has placed a contract for "several million dollars worth" of turbosuperchargers, armament systems and other equipment with General Electric Co. Material will be used on B-50 bombers being built by Boeing Airplane Co.

—o—

Bellows Co., Akron, manufacturer of pneumatic devices, has realigned its sales regions into five divisions, Eastern, Midwestern, Central, Southern and Western. Managers for each region will be appointed. The only appointment thus far has been Harold P. Granger to head the Eastern Division, with headquarters in Boston.

—o—

Koppers Co. Inc., Pittsburgh, has inaugurated a retirement benefit plan applicable to all hourly-paid employees who reach the age of 65 and have been with the company 15 years or more. All costs will be paid by Koppers.

—o—

Hotpoint Inc., Chicago, maker of household appliances, has formed a merchandising division to handle all marketing functions concerned with advertising, sales training, home economics, sales, promotion and special campaigns. This division becomes one of five Hotpoint marketing groups.

—o—

War Assets Administration has assigned three surplus plants to Joseph P. Day Inc., New York, to be auctioned in April. Minimum acceptable prices are: $796,120 for Plancor 502 at Harrisburg, Pa., used by Harrisburg Steel Corp.; $220,000 for Plancor 283 at Rochester, N. Y., used by Symington-Gould Corp. and $504,960 for a Navy plant at Toledo, O.

—o—

National Bureau of Standards has released the printed edition of a commercial standard for formed metal porcelain enameled sanitary ware. Copies may be obtained from Government Printing Office, Washington.

—o—

Charles D. Spencer & Associates Inc., Chicago, is offering without charge to employers "Taxes and Profit Sharing Plans," a booklet which explains the U. S. Treasury-approved profit sharing plans under which employers and employees are accorded favorable income tax treatment. Company address is 166 W. Jackson Blvd.

—o—

U. S. Electrical Motors, Los Angeles, manufacturer of motors, is doubling the size of its Milford, Conn., plant. Facility is expected to be completed next June.

—o—

Standard Oil Co. of New Jersey, New York, has changed its name to Esso Standard Oil Co.

—o—

Homestead Valve Mfg. Co., Coraopolis, Pa., recently began full-scale production of its steam-generating cleaning unit in a new $400,000 plant at Coraopolis.

—o—

Milwaukee Chaplet & Mfg. Co., Milwaukee, maker of die makers' machines, foundry equipment and other items, has changed the name of its Machinery Mfg. Division to Rice Pump & Machine Co. R. D. Houghton continues as general manager and sales manager of Rice which will remain as an operating division of the parent company.

—o—

Revere Copper & Brass Inc., New York, is negotiating to acquire a plant at Riverside, Calif., for manufacture of copper clad stainless steel cooking utensils. Firm has begun erection of another plant for the manufacture of seamless copper and alloy tubing and brass rod in Los Angeles.

—o—

American Bridge Co., Pittsburgh, U. S. Steel Corp. subsidiary, reports that at its Ambridge, Pa., plant 3500 men recently piled up 1,300,271 manhours of work without a lost-time accident.

—o—

General Electric Co., Schenectady, N. Y., has work in progress on construction of a high-voltage engineering laboratory at Pittsfield, Mass., for study of lightning and other high-voltage phenomena.

—o—

Tennessee Gas Transmission Co., Houston, Tex., last month tied in a new section of a pipeline from Texas to serve the Appalachian area. This section brings Tennessee's transmission capacity to almost 400 million cubic feet daily, 100 million over the 1947 daily average

—o—

Tennessee Coal, Iron & Railroad Co., Birmingham, U. S. Steel Corp. subsidiary, has contracted for iron ore from Brazil and Sweden to augment local ore during the remainder of 1948. First shipment of 9000 tons from Brazil arrived last month.

—o—

Westinghouse Electric Corp., Pittsburgh, expects to produce 750,000 home radio receivers in 1948, 50 per cent more than the record number of sets manufactured in 1947.

—o—

Harbison-Walker Refractories Co., Pittsburgh, has almost completed its $2 million plant in Baltimore. One kiln is already in operation.

—o—

Chemical & Pigment Co., Baltimore, is erecting a plant in Baltimore to house equipment for recovery of iron sulphate from raw materials by means of a new process.

—o—

Wayne University, Detroit, has organized an Audio-Visual Materials Consultation Bureau, designed to furnish material for industrial training programs, market analyses and distribution surveys. Dr. Arthur Stenius is in charge.

—o—

Manufacturers Plating Corp. has purchased the business of Langs Plating & Mfg. Co., 487 W. Alexandrine, Detroit, and will expand facilities there for handling plating work for the automotive and refrigeration industries. Manufacturers Plating is also considering the installation of die casting equipment.

The Business Trend

WITH restrictions on use of industrial gas lifted and transportation tie-ups untangled, those industries which had been adversely affected over the past month are rapidly returning to levels of operations prevailing before the cold spell. Return of milder weather brought upturns in all but one of the basic indicators of industrial production.

STEEL's index of industrial production rose nine points in the week ended Feb. 21 to 166 per cent (preliminary) of the 1936-1939 weekly average.

STEEL—Operating rate of the steel industry advanced a half point to 93.5 per cent of capacity in the week ended Feb. 21 as freer movement of scrap and other raw materials became possible. Barring major labor trouble in industries closely related to steel, sustained higher rates of production are indicated.

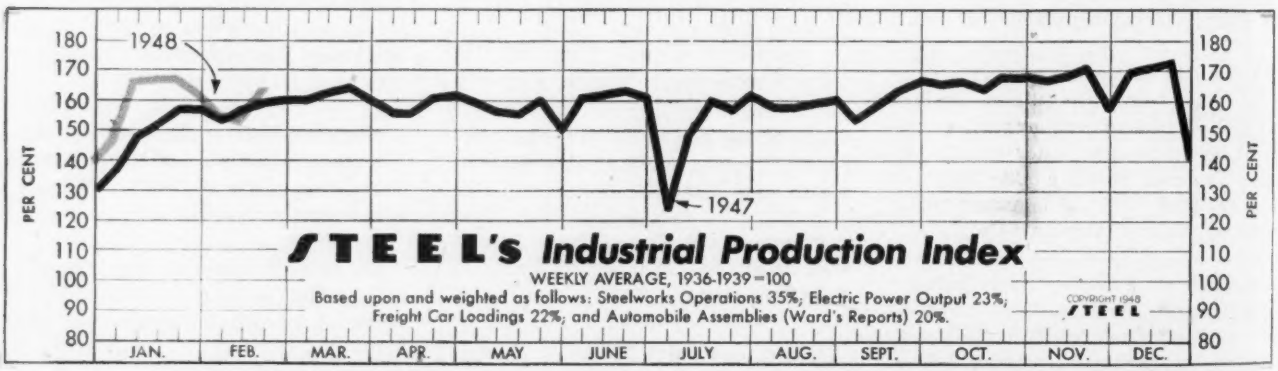
PRICES—Led by a 7.5 per cent drop in prices of farm products, the Bureau of Labor Statistics wholesale price index skidded off 2.5 per cent to 159.7 per cent of the 1926 average in the week ended Feb. 14. The break, which was one of the sharpest since the weekly index was established, brought average prices to 3.5 per cent under the postwar peak of mid-January, and to approximately the level of late November, 1947. Raw materials showed a 4.9 per cent drop in the latest seven-day period and manufactured goods were off 1.4 per cent.

GROSS PRODUCT—The total market value of goods and services produced in the nation last year at $230 billion was 13 per cent above that of 1946, according to the Department of Commerce. The national income rose from $178 billion in 1946 to $203 billion in 1947. Most of the increase in gross product stems from price inflation, the department explained. Purchases of durable equipment by producers were 40 per cent higher in 1947 than in 1946, and a substantial part of this gain reflected increased output rather than higher prices.

TRUCKLOADINGS—Volume of freight transported by motor carriers in 1947 broke all previous records, and the index of average monthly tonnage compiled by the American Trucking Associations Inc. rose to 206 per cent of the 1938-1940 average, 20 points above the previous peak in 1943. The index for December stood at 216, with volume in that month 11.3 per cent above the like month of 1946. Carriers of iron and steel, hauling about 4 per cent of total truck freight, reported volume in December was 7.3 per cent above November and 36.1 per cent over December, 1946.

RAILROADS—Higher level of freight traffic at somewhat higher rates raised net income of railroads in 1947 to $480 million, compared to $293 million in 1946, Association of American Railroads announces.

GEARS—Orders received by the gear industry, as reported by the American Gear Manufacturers Association, increased 6.8 per cent in 1947 over 1946, and volume of shipments last year was 42.9 per cent greater than in the previous year.



Index (chart above): Week Ended Feb. 21 (preliminary) 166 Previous Week 157 Month Ago 169 Year Ago 159

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	93.5	93.0	96.5	94.5
Electric Power Distributed (million kilowatt hours)	5,370‡	5,385	5,436	4,778
Bituminous Coal Production (daily av.—1000 tons)	1,872	1,920	2,172	2,058
Petroleum Production (daily av.—1000 bbl.)	5,342	5,347	5,336	4,786
Construction Volume (ENR—Unit $1,000,000)	$88.6	$133.5	$118.9	$98.5
Automobile and Truck Output (Ward's—number units)	109,157	83,996	110,774	103,400

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons. ‡ Preliminary.

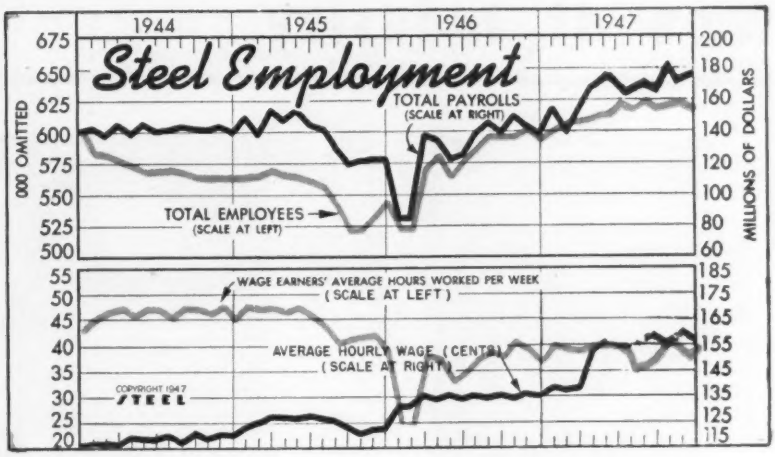
TRADE				
Freight Carloadings (unit—1000 cars)	780†	734	772	777
Business Failures (Dun & Bradstreet, number)	100†	128	109	58
Money in Circulation (in millions of dollars)‡	$28,053	$28,189	$28,211	$28,276
Department Store Sales (change from like wk. a yr. ago)‡	−3%	+9%	+4%	+17%

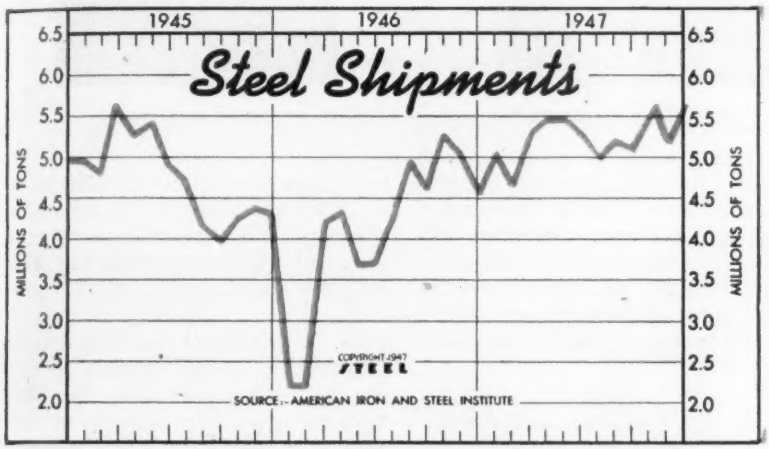
† Preliminary. ‡ Federal Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1947	1946	1947	1946	1947	1946
Jan.*	601	522	$155.8	$84.9	138.1	131.4
Feb.*	607	522	139.5	84.9	137.0	131.4
Mar.	609	570	150.6	138.8	137.9	135.1
April	611	582	168.3	134.3	153.3	134.1
May	615	563	175.8	121.4	155.6	135.8
June	623	578	167.6	125.6	154.7	134.4
July	623	585	163.2	138.0	153.9	135.1
Aug.	625	596	169.1	145.2	155.6	134.6
Sept.	618	596	168.9	139.6	157.1	136.2
Oct.	620	596	180.1	150.6	154.6	134.1
Nov.	624	600	171.0	143.4	158.7	136.7
Dec.	621	594	175.3	137.2	156.5	135.2

† Monthly average. * Figures for January and February, 1946, are merely averages derived from a report that combined those two strike-affected months.





Steel Shipments

(Net Tons)

	1947	1946	1945
Jan.	5,061,333	2,189,369*	4,940,160
Feb.	4,626,424	2,189,368*	4,776,377
Mar.	5,304,415	4,213,913	5,632,155
Apr.	5,445,993	4,335,694	5,254,064
May	5,442,343	3,666,677	5,417,051
June	5,263,711	3,687,509	4,891,228
July	4,974,566	4,259,494	4,696,895
Aug.	5,278,223	4,965,456	4,123,578
Sept.	5,118,839	4,589,902	3,955,198
Oct.	5,681,597	5,260,832	4,267,177
Nov.	5,216,990	5,019,984	4,366,567
Dec.	5,613,036	4,533,420	4,297,502

* Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,378,737.

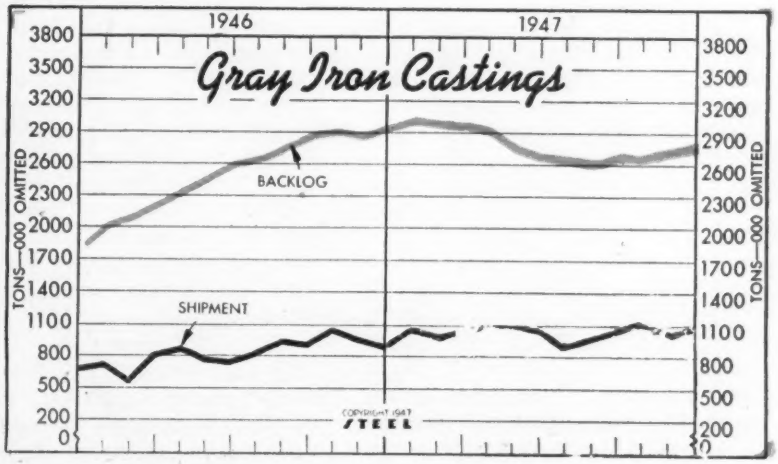
Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1947	1946	1947	1946
Jan.	1,078	727	3,021	2,096
Feb.	1,010	572	2,987	2,182
Mar.	1,090	820	2,979	2,285
Apr.	1,097	886	2,908	2,430
May	1,097	783	2,783	2,531
June	1,038	757	2,711	2,640
July	913	840	2,657	2,708
Aug.	952	973	2,631	2,814
Sept.	1,025	937	2,680	2,897
Oct.	1,154	1,078	2,669	2,953
Nov.	1,020	987	2,687	2,940
Dec.	1,066	909	2,782	2,980
Total	12,541	10,270		

* Unfilled orders for sale to the trade.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,741	$12,455	$14,058	$13,879
Federal Gross Debt (billions)	$254.8	$254.7	$256.6	$259.4
Bond Volume, NYSE (millions)	$16.5	$16.8	$23.8	$15.2
Stocks Sales, NYSE (thousands)	3,770	4,813	5,144	4,579
Loans and Investments (billions)†	$64.4	$64.9	$65.1	$63.5
United States Gov't. Obligations Held (millions)†	$36,791	$37,315	$37,587	$40,023

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$81.14	$78.59	$78.41	$69.73
All Commodities†	159.7	163.8	165.5	143.1
Industrial Raw Materials†	173.4	182.3	186.0	154.3
Manufactured Products†	154.5	156.7	157.6	139.1

† Bureau of Labor Statistics Index, 1926= 100.

Men of Industry

LESLIE McARTHUR

ROBERT K. FOLLANSBEE

DR. A. B. KINZEL

Leslie McArthur, manager, Chandler-Evans Division, Niles-Bement-Pond Co., West Hartford, Conn., has been elected a vice president. He assumed his former position in 1947, when he joined the company, and had previously been executive assistant, Underwood Corp. **Richard F. V. Stanton** has resigned as vice president and assistant sales manager of machine tools.

—o—

Lee Stratton has been appointed merchandise director of the Parts Division, Reynolds Metals Co., Louisville. He has been associated with the Crosley Division of Avco Mfg. Co. in Cincinnati, where he served as domestic sales manager, and previous to that was connected with Nash-Kelvinator Corp.

—o—

Announcement has been made by Hettrick Mfg. Co., Toledo, O., of the election of **I. P. Smith,** formerly president of the company, to the newly created position of chairman of the board. Succeeding Mr. Smith as president is **W. I. Smith,** formerly executive vice president.

—o—

Hans Bohuslav has joined Engineering Controls Inc., Los Angeles and New York, as vice president in charge of engineering. For the past five years, Mr. Bohuslav has been vice president in charge of engineering for the Sterling Engine Co., Buffalo, and for ten years prior to that, he served in a similar capacity with Enterprise Engine & Foundry Co., San Francisco.

—o—

W. K. Millholland Jr. has succeeded to the management of the W. K. Millholland Machinery Co., Indianapolis, sales representative and manufacturer of special production machinery. He has been associated in the business with his father, the late **W. K. Millholland Sr.,** for a number of years, and has been in charge of the firm's operations during the past four months.

—o—

Robert K. Follansbee has been elected secretary-treasurer of Follansbee Steel Corp., Pittsburgh, succeeding the late **Edgar Masters.** Mr. Follansbee has been associated with the corporation or its affiliates since 1928, having held positions in the operating department and later appointed to executive positions with the Sheet Metal Specialty Co. At the time of the merger of this company with the Follansbee Steel Corp. in 1946, he was appointed vice president and assistant general manager of sales.

—o—

Appointment of **F. C. Ritner,** formerly personnel director, Carboloy Co. Inc., Detroit, to the position of vice president in charge of personnel, has been announced by the company.

—o—

Joseph R. Lex has been appointed assistant general manager of Progressive Welder Co., Detroit.

—o—

A. L. Gutterson, J. B. Johnson and **C. N. Safford** have been elected directors of Lovejoy Tool Co. Inc., Springfield, Vt. **C. N. Safford** has also been elected president of the company, and **C. E. Hopkins,** treasurer.

—o—

M. G. Sternberg has been elected president of Continental Foundry & Machine Co., Chicago. **H. A. Forsberg, B. P. Hammond,** and **A. E. Murton** have been elected vice presidents. **K. B. Hall** was chosen a director of the company. Formerly executive vice president, Mr. Sternberg has been with the company since 1918.

—o—

Dr. A. B. Kinzel has been elected president of Union Carbide & Carbon Research Laboratories Inc., New York. He has been associated with various metallurgical units of Union Carbide & Carbon Corp. since 1926. Dr. Kinzel is director of the American Welding Society, director of the American Institute of Mining & Metallurgical Engineers, and chairman of the Engineering Foundation Board, as well as chief consultant in metallurgy to the Los Alamos Laboratories and the Argonne National Laboratories of the Atomic Energy Commission.

—o—

Dale D. Spoor has been appointed sales promotion manager of Air Reduction Sales Co., New York. **Russell S. Schmidt** succeeds Mr. Spoor as dealer sales manager.

—o—

James R. Sebastian has been elected president and general manager, Rapids-Standard Co. Inc., Grand Rapids, Mich. He has been serving as general manager, and succeeds **Lloyd C. Backart** as president. Mr. Backart has been elected chairman of the board. Other officers elected are secretary-treasurer, **Roger S. Calvert;** vice presidents, **Paul F. Millett, Howard R. Pearl** and **Robert L. Gunnell;** and assistant secretary and treasurer, **Eugene L. Hummell.**

—o—

H. G. Erickson, chief structural engineer, Luscombe Airplane Corp., Dallas, Tex., has been made chief en-

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gineer of the corporation. He succeeds **E. W. Norris.**

—o—

Ernest V. Moncrieff, formerly president, Swan-Finch Oil Corp., New York, has been elected chairman of the board. **Howard F. Moncrieff,** formerly vice president in charge of sales, has been elected president and chief executive officer.

—o—

Timken Roller Bearing Co., Canton, O., announces changes in its Bearing Division: **Blair Glenn,** general superintendent, Canton Bearing Division, has been promoted to assistant factory manager of the division. **Henry Tobey,** factory metallurgist, has been appointed to succeed Mr. Glenn as general superintendent. **Fred Barnard,** assistant factory metallurgist, succeeds Mr. Tobey as factory metallurgist. **Joseph Selby** has been appointed assistant factory metallurgist. **Russell P. Fowler,** assistant general superintendent of the Columbus, O., plant, has been appointed superintendent of the Bucyrus, O., bearing factory, where operations will begin early this spring.

—o—

Howard Ledeen has been appointed to head all sales of Ledeen heavy duty cylinders for the manufacturer, Engineering Products Co., Los Angeles.

—o—

C. Richard Newpher, production manager, Ivanhoe Division, Reliance Electric & Engineering Co., Cleveland, for the past two years, has been made division manager as well. In his enlarged responsibilities, Mr. Newpher will also have charge of the plant at 1170 Ivanhoe Rd., purchased by the company in January from the Detroit Steel Corp.

—o—

The following changes in its factory management organization have been announced by Fairbanks, Morse & Co., Chicago: **W. H. Holbert,** for the past 20 years manager of the company's Stuttgart, Ark., works, has been appointed manager of the Three Rivers, Mich., plant, succeeding **Karl E. Barrett,** resigned. **J. R. Walsh,** for several years assistant manager of Fairbanks-Morse Westco works in St. Louis, has been transferred to the Stuttgart works, and has been appointed works manager.

—o—

John Doerfner Jr. has been appointed plant manager, and **Carl H. Beverly,** resident comptroller, of the gray iron foundry being built at Defiance, O., by Central Foundry Division of General Motors Corp. Mr. Doerfner was associated with Saginaw Malleable Iron Division until 1938, and later with Erie Malleable Iron Co., Erie, Pa.; Bendix Products, South Bend, Ind.; Eastern Aircraft Division of General Motors; and Gunite Foundries Corp., Rockford, Ill. He joined the Central Foundry Division at the Lockport, N. Y., plant in 1946.

—o—

Charles S. Glenn has resigned as assistant sales manager of Rotary Electric Steel Co., Detroit, to enter business for himself as manufacturer's representative.

—o—

Nils Lou, former factory manager, Glenn L. Martin Co., Baltimore, has been appointed tractor plant manager of Harry Ferguson Inc., Detroit. A mass production assembly line specialist, he came to this country from Denmark at the age of 18, working for a time with Motor Products Corp., Detroit. In 1929 he joined Glenn Martin Co.

—o—

Harris Kruse has been named plant manager of the Newport, Pa., factory of Snap-On Tools Corp., Kenosha, Wis. He formerly was cost accountant for the firm's four Snap-On plants, and has been with the company for 20 years.

—o—

The following personnel changes have been announced by the Columbia Chemical Division of Pittsburgh Plate Glass Co., Pittsburgh: **Robert M. Simpson** has been appointed district sales manager, with headquarters in Chicago. **Brooks M. Dyer** has been named assistant district sales manager at St. Louis. **C. C. Thompson,** credit manager for the division, will continue in that capacity and also assumes the responsibility of office manager at the division's headquarters, in Pittsburgh. **Paul R. McHall** has been appointed manager, order and service department, with headquarters in Pittsburgh.

—o—

Paul H. Ralston has joined the research department of Calgon Inc., Pittsburgh, and will devote his full time to research aimed at improving Banox, a rust-proofing chemical manufactured by the company.

—o—

Donald M. Morrison has become associated with American Fire Clay & Products Co., Cleveland and Canfield, O., in the capacity of sales engineer.

—o—

Howard C. Williams, since 1940 sales manager of the Merchant Trade Division, Continental Steel Corp., Kokomo, Ind., has been named sales manager of the Sheet Division of the company. He has been associated with the corporation since 1934.

—o—

J. M. Lambie, president, Findlay Clay Products Co., Washington, Pa., has been elected president of Jessop Steel Co., also at Washington. He has been a director of the latter company for the past 10 years. **E. M. Griffith,** previously associated with Crucible

C. RICHARD NEWPHER

NILS LOU

HOWARD C. WILLIAMS

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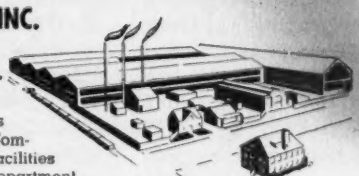

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Steel Co. of America, and Union Drawn Steel Division, Republic Steel Corp., has been elected executive vice president of Jessop Steel Co.

—o—

Robert F. Johnston has been named assistant general sales manager, Eastern Stainless Steel Corp., Baltimore. He joined Eastern Stainless as sales service engineer in 1945, after two and a half years with the U. S. Navy Department in Washington, as buying officer for rolled steel products. Prior to joining the Navy, Mr. Johnston was with Carnegie-Illinois Steel Corp.

—o—

Frederic H. Case Jr. has been appointed field representative, public relations, American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp. In his new capacity, he will have charge of public relations activities for the company in the plant cities of Worcester, Mass., New Haven, Conn., and Trenton, N. J., and will have headquarters at Worcester.

—o—

Ronald S. Drysdale has retired as special representative in charge of metalworking and cutting oils for Sun Oil Co., Philadelphia, but will continue with the company as a special consultant and will undertake a series of experiments with cutting oils at the company's Marcus Hook refinery.

—o—

R. Larracuenta has been appointed export manager of Keller Tool Co., Grand Haven, Mich.

—o—

H. F. Hazel has been named superintendent of Southwest Steel Rolling Mills, Los Angeles.

—o—

Frank W. Seivert has been appointed advertising manager for the Kellogg Division, American Brake Shoe Co., New York, and will have headquarters in Rochester, N. Y. Since joining the company in 1941, Mr. Seivert has served in various production and purchasing capacities.

—o—

E. Richard Walter has been appointed sales manager, Powdered Metal Products Corp., Chicago. He had been chief metallurgist of the company. He will maintain his central office at the Franklin Park plant.

—o—

Raymond T. Doherty has joined the General Division of York-Shipley Inc., York, Pa.

—o—

Appointment of **H. E. Cable** as district manager of the Pittsburgh office has been announced by Lincoln Electric Co., Cleveland. He joined the company in 1943, and has been active since then as a welding engineer in the Pittsburgh area. **J. S. Roscoe** has been appointed district manager for the Chicago office. He formerly was district manager at Pittsburgh.

W. H. DUPKA

Vice president and controller, Jones & Laughlin Steel Corp., Pittsburgh, elected a director. Noted in STEEL, Feb. 23 issue, p. 81

CHARLES T. SLONAKER

Elected chairman of the board and president, Hyde Park Foundry & Machine Co., Hyde Park, Pa. STEEL, Feb. 23 issue, p. 76

—o—

Daniel Bohm has been named general superintendent of the Salem plants of Mullins Mfg. Corp., Warren, O. He has been superintendent of the company's plant 1 at Salem, O., since 1937.

—o—

T. H. Bateman has joined the sales department of Pipe & Tubular Products Inc., Philadelphia, as a special representative in charge of railroad sales. He has been connected with the company for the past 15 years.

—o—

Charles W. Young has been appointed plant manager, Pennslyvania Flexible Metallic Tubing Co., Philadelphia.

—o—

J. Donald Rollins, for the last five years assistant chief engineer of Gary Works, Carnegie-Illinois Steel Corp., subsidiary of U. S. Steel Corp., has been promoted to the post of chief engineer of this subsidiary plant. He succeeds **Sigurd Landen,** who has been promoted to the position of Chicago district chief engineer of Carnegie-Illinois.

—o—

Robert C. Myers has been appointed manager of the Market Development Division of Carnegie-Illinois Steel Corp., U. S. Steel Corp. subsidiary, succeeding **R. J. Ritchey,** recently appointed director of the new Market Development Division of U. S. Steel Corp.

—o—

Harry M. Hubbard has been appointed district representative for the Cleveland and northeastern Ohio territory of Waltham Grinding Wheel Co., Waltham, Mass.

—o—

A. D. Vining has been made general sales manager at White Products Co., Middleville, Mich.

—o—

Jack B. May, district sales manager, Benjamin Wolff & Co., Chicago, has been promoted to general manager of sales. He is succeeded by **Walter M. Carlsen** as district sales manager.

—o—

Louis Allis Co., Milwaukee, announces the creation of three new offices, and the election to these offices of **Louis Allis Jr.,** vice president in charge of sales; **Frank O. Kovich,** vice president in charge of manufacturing; and **T. R. Wieseman,** vice president in charge of engineering. In addition to these elections, **C. G. Skidmore** was appointed sales manager; **James H. Daganhardt,** chief engineer, and **John J. Kirkish,** chief of electrical design.

—o—

Robert G. Glover has resigned as vice president of Alberto Ubbelohde Inc., New York, to take up a post in the foreign service. **Robert Gueydan,** formerly secretary-treasurer, succeeds Mr. Glover as vice president, and **Walter I. Bastiansen,** formerly traffic manager, has been elected secretary and treasurer.

—o—

Black & Decker Mfg. Co., Towson, Md., has announced the following promotions and changes in its outside sales organization: The former subbranch at Charlotte, N. C., has been established as headquarters for a new territory comprising the states of North Carolina and South Carolina. **G. M. Buchanan,** former branch man-

F. KERMIT DONALDSON

Has been elected president, Steel Founders' Society of America. Noted in STEEL, Feb. 23 issue, p. 54

BRADFORD C. COLCORD

Elected president, Woodward Iron Co., Birmingham. Noted in STEEL, Feb. 23 issue, p. 80

ROWLAND D. KOENITZER

Appointed assistant chief engineer, Brown Fintube Co., Elyria, O. Noted STEEL, Feb. 23 issue, p. 80

ager at Baltimore has been placed in charge of this new branch. **J. P. Spain,** former sales engineer at Chicago, has been promoted to branch manager in charge of the Baltimore branch. **Arthur S. Boehm,** former sales engineer at Pittsburgh, has been promoted to branch manager in charge of the San Francisco branch, succeeding **A. W. Helbush,** resigned. The following sales engineers have been appointed, in most cases representing promotions from the company's service organization: **David Harrison,** from Memphis service to sales in Baltimore territory. **Harold Bond,** New Orleans service to sales in New York territory. **A. S. Fehsenfeld,** Towson office to sales in Chicago territory. **Coy Quesenberry,** Chicago service to sales in Baltimore territory. **Kenneth Schmelig,** St. Louis service to sales in St. Louis territory. **R. E. Stone,** New York service to sales in Los Angeles territory. **L. C. Kaefer,** Buffalo sales to sales at Pittsburgh sub-branch. **E. O. Gulley,** Charlotte service to sales in Atlanta territory. **Nels Westerberg,** Chicago service to sales in Chicago territory, and **Evan Davis,** Pittsburgh service to sales at Pittsburgh sub-office.

—o—

Norman Weinstein, formerly with Trane Co., Chicago, has become associated with Calumet Iron & Supply Co., East Chicago, Ind., as vice president in charge of its Calisco Engineering Division. For the past 16 years, Mr. Weinstein has been active in the field of commercial air and gas conditioning equipment.

—o—

A. J. Langhammer, president, Amplex Division, Chrysler Corp., Detroit, has been given the Stevens Institute Award for outstanding achievement in the development and use of powder metallurgy in the production of bearings and machine parts for American industry.

—o—

Robert M. Norton has been transferred from manager of the New York state territory of Hanson-Van Winkle-Munning Co., to company headquarters in Matawan, N. J., to engage in sales promotional activities of electroplating and polishing equipment and supplies.

OBITUARIES . . .

Robert P. Lamont, 80, Secretary of Commerce under President Hoover, and president for one term of the American Iron & Steel Institute, 1932-33, and head of the American Steel Foundries, Chicago, 1912-1929, died recently in New York. He was first vice president of Simplex Railway Appliance Co., of which he was an organizer and which eventually was purchased by the American Steel Foundries. He had been chairman of the Griffin Wheel Co., and director of American Radiator Co., International Harvester Co. and the Globe Steel Tubes Co., among other enterprises.

—o—

Thomas Moses, 78, formerly head of the soft coal mines of U. S. Steel Corp. as president of the H. C. Frick Coke Co., U. S. Coal & Coke Co., and other coal producing subsidiaries of the corporation, and later vice president in charge of raw materials of U. S. Steel Corp., died Feb. 20 in Danville, Ill.

—o—

William K. Millholland Sr., 63, founder, W. K. Millholland Machinery Co., Indianapolis, died recently. He had been associated with the machine tool industry for more than 40 years.

—o—

James H. McGraw Sr., 88, founder of McGraw-Hill Publishing Co. Inc., New York, publisher of business papers, died Feb. 21 in San Francisco. He retired in 1935 as chairman of the board, but remained as a director. He had served as president of the company until 1928, when he became chairman.

—o—

P. F. Beal Jr., 46, partner in the well-drilling and pumping machinery firm, P. F. Beal & Sons, Brewster, N. Y., died Feb. 20 in Boston.

—o—

Burton G. Tremaine, 84, co-founder of Nela Park in Cleveland, lamp department of General Electric Co., Schenectady, N. Y., active in the affairs of General Electric for 35 years, and a director of the company for more than 20 years, died Feb. 26.

—o—

Charles Schultz, 55, president, U. S. Steel Wire Spring Co., Cleveland, died Feb. 22 at his home in Solon, O.

—o—

Joseph Meinberg, 64, died recently while at his work as superintendent of American Steel Foundries, King Machine Tool Division, Cincinnati.

—o—

Robert J. Murray II, 46, secretary-treasurer, Jessop Steel Co., Washington, Pa., died Feb. 23.

—o—

William J. Bond, director of personnel services, A. O. Smith Corp., Milwaukee, died Feb. 16.

—o—

Louis G. Vock, acting manager, Chicago district office, Metal & Thermit Corp., New York, died recently.

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Engineering News . . . AT A GLANCE

LONGER STARTING POWER—Instead of customary lead plates and acid solution, new type auto batteries in prospect for the motorist include nickel-plated, cadmium-steel cells immersed in an alkaline bath. Now being developed by Nickel Cadmium Battery Corp., the battery is expected to last three times longer than those used at present. Actually, the battery is not new, being used in Europe for several years. It was first produced in this country for the government during the war. Present output is confined to large, heavy units for diesel engine starting motors, trucks and busses.

TELEVISES BOILER READINGS—Principles of televising are beginning to seep into the industrial picture. In Chicago, they are aiding boiler operators at Commonwealth Edison's Fisk generating station. The boilers, towering 100 feet, make it impossible for operators to read gages on top. Through a television setup, readings are flashed down to a spot beside the control panel. The experiment is second such attempt in the country. The other is in the Hell Gate station of Consolidated Edison in New York.

CUTS ENGINE VIBRATION—Unique testing machine of electronic type developed by Buick research engineers for evaluating frictional characteristics of synthetic compounds, or any material usable as a spring, was instrumental for the "controlled frequency" engine mountings now being incorporated in current models. The mountings now provide complete control of engine, as well as chassis vibrations due to road conditions. Each consists of a three-point suspension—two mounts at the front, one on each side, and one at the rear that includes two separate parts—located at the torque tube ball joint at the end of the transmission.

NO "PUSH-BUTTON" METHOD—When considering materials for a specific product, analysis of service requirements of the part must be made with an eye to stress conditions and stress distributions to be imposed on the part in use. However, selection of materials on basis of outstanding physical property is not the sole determining factor, according to the Drop Forging Association. Naturally, test reports are of value to the engineer, but these are valuable only as guides, and for reference. In fact, no rigid formula can be given to insure correct choice of materials in a "push-button" manner. The determination should be based on experience with both materials and fabricating processes as well as supporting evidence of comprehensive test information.

TAILOR-MADE IDLERS—It is now possible to practically tailor-make idler installations to fit the conveyor belt by means of an adjustable troughing idler invented recently by P. J. Conners of Koppers' engineering and construction division in Pittsburgh. The development, which is reported to increase life of conveyor belts, enables outer inclined pulleys to be adjusted from slightly above the horizontal up to an angle of 25 degrees. Its design allows a suitable number of adjustable idlers to be used in forming a vertical curve and provide shallowest depth trough necessary to retain material without spilling. Number of these idlers used on the feed and discharge ends of belt conveyors allows belt to be troughed or flattened gradually, and cuts down belt strain caused by belt distortions.

ATOMIC ENGINEERING—Discovery of a material with very low absorption qualities seems to be one of the important problems facing engineers so far as harnessing atomic energy is concerned. Most materials investigated show a marked tendency to absorb neutrons, a characteristic that disqualifies them for structural uses in reactors. Cadmium, for example, possesses such an affinity for neutrons that a very small amount stops completely the operation of a reactor. Unfortunately, the same is true of steel structural materials. Existence of impurities even a few parts per million in materials in which neutron absorption is relatively low, makes these unsuitable for reactor duty. (p.88)

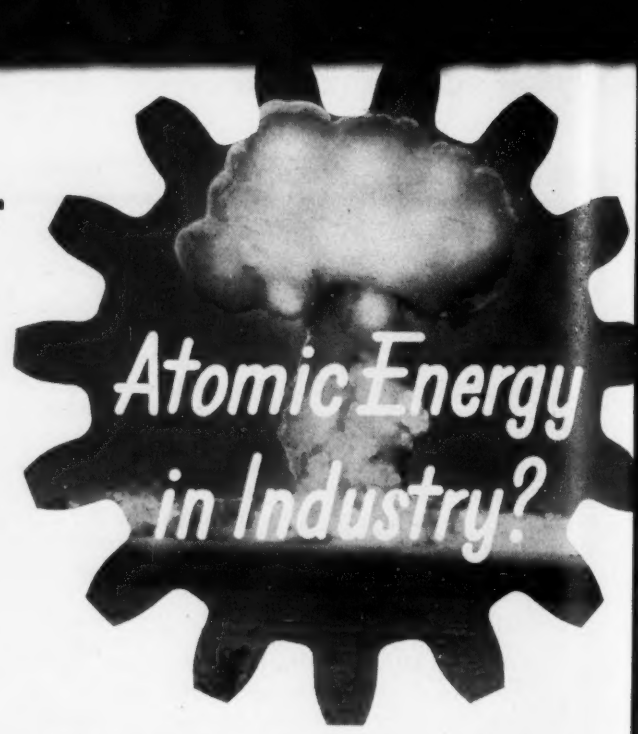
VEINED CASTINGS—Heat checking of die steels encountered when casting higher melting alloys, ultimately results in cracks of considerable depth. Pressure applied to the molten alloy forces it into these cracks so that raised veins appear on the castings, and the castings becomes harder to eject. Veins, it is pointed out, do not injure the casting, except that it becomes rougher and the veins are detrimental to appearance. They can be machined off, if the added labor is justified. (p.90)

CUTS DOWN ON DUST—Angular steel grit is found to be a very satisfactory abrasive for preparing surfaces prior to sprayed coating applications. Apart from economy of its use, there are other advantages associated with it. For example, steel grit generates no dust of its own during blasting operations, thus creates a comparatively dust-free surface. Smaller grains blast the surface more rapidly, but they do not roughen it to the same degree as larger sizes. Equal parts of No. 30 and 40 grades are recommended for producing very satisfactory results. (p.93)

USES SEVEN DRAWS—Process of producing the housing of an escapement type integrator in the plant of Bailey Meter Co., Cleveland, includes seven drawing operations. The 16-gage sheet is annealed after the first draw in a 150 ton press, then reduced twice and further annealed. Prior to final draw, the work is subjected to annealing once more to obtain the desired physical properties of the metal. (p.96)

News Summary—p. 57 Market Summary—p. 149

What's in the future for Atomic Energy in Industry?



A vast, tangled, little-known jungle of engineering problems lies between the atom bomb and the actual commercial use of fission energy. With a healthy respect for the size of the job, the author discusses some formidable obstacles to be overcome

By J. A. HUTCHESON
Associate Director
Westinghouse Research Laboratories
East Pittsburgh, Pa.

NO ONE questions that it is technically possible to achieve the controlled release of atomic energy in a form that can be converted into heat or electricity. However, before this is actually an accomplished fact there is a great amount of work to be done.

This work falls into two general classifications, namely, research and engineering development. At present there is under way in this country a research program, co-ordinated and directed by the Atomic Energy Commission which, as time goes on, will uncover fundamental knowledge of this new science that is essential before industrial applications of atomic energy are practical. Undoubtedly, therefore, as the store of available knowledge increases, there will come a time when answers to the many questions relating to practicality of atomic energy in industry can be determined with reasonable certainty.

That the application of atomic energy in industry will eventually be proved practical is assumed. What then are the engineering problems that must be solved before the first practical electric power generating station can be built?

The method by which a chain-reacting pile of nuclear-reactor operates has been widely discussed. The products of that fission are two elements each of substantially lower atomic weight, gamma-ray radiation, the discharge of one to three neutrons, and the release of extremely large amounts of energy. Further, some of the neutrons released eventually strike the nuclei of other U-235 atoms, whereupon the process is repeated, i.e., a chain reaction is established. However, the chances of a neutron striking the nucleus of another atom of U-235 are subject to several factors.

Obviously, other kinds of atoms are present in a reactor. For example, there are those of the reactor coolant or heat-transfer medium, the structural material, and surrounding shielding, those of the many control elements and devices essential to the operation of the reactor, as well as atoms of the many other elements that are the products of previous fission of U-235 atoms.

A few materials are partially "transparent" to neutrons. In some, such as carbon, absorption of a neutron is relatively unlikely. A nuetron that enters such a material may collide with atoms of the material and be slowed up or lose part of its energy as a result, but in general it does not combine with these atoms and therefore is not absorbed. Again, the chances of absorption of a neutron depends in a complex way on the energy of the neutron.

These facts were employed in designing the reactors at Hanford, Wash. In these reactors the fission-produced neutrons released with high energy are slowed down by collisions with atoms of carbon in the moderator to the point that the average energy of the neutrons that re-enter the U-235 is most favorable to their absorption.

Most materials investigated show a marked tendency to absorb neutrons, a characteristic that disqualifies them for structural uses in reactors. This is dramatically demonstrated by the use of cadmium in control devices. Cadmium has such an affinity for neutrons that a very small amount stops completely the operation of a reactor. Cadmium absorbs enough neutrons to reduce the ratio of the number of neutrons available for fission, to the number of fissions required to maintain operation to less than one.

When this occurs action ceases, since a single neutron can produce but one fission. Obviously such a material is useless as a structural material in a reactor. Unfortunately, the same is true of the common structural materials such as steel. This also explains why the materials must be of unusually high purity. The existence of impurities to the extent of a few parts per million in materials in which neutron absorption is relatively low makes these matrials unsuitable for use in a reactor.

Similarly the fact that the fission products act as neutron absorbers explains the necessity for removal of these products from time to time during continued operation of a reactor. As more and more of these products are formed, an increasing percentage of the available neutrons is absorbed. This requires a reduction in the amount of control material in the reactor. Ultimately there comes a time when this process cannot be continued, i.e., when all of the control material has been removed. Unless means are provided to remove "poisoned" charges during operation, the reactor must thereupon be shut down and the fuel charge replaced. In any power generating applica-

tion it seems essential that continuous operation be possible.

From considerations such as the foregoing, one type of engineering problem appears. Once complete information is obtained as to the neutron-absorption characteristics of materials it will then be necessary to obtain the structural characteristics of those that appear applicable in reactors. This is an engineering problem that can and will be handled by engineers.

Another element that will require engineering consideration arises from the fact that the reactor will in all probability be required to operate at high temperatures, where heat engines are more efficient. This requirement creates additional problems for the engineer. For example, questions will arise as to the corrosion of materials subjected to high temperatures. Probably data must yet be obtained relative to the corrosive effect of various gases or liquids used as coolants or heat transfer media in contact with materials suitable for use within a reactor.

The high temperatures expected in power reactors introduce additional unknowns that must be determined prior to practical use. The mechanical properties, particularly at high temperatures, of those materials that now appear practical for use in construction of a reactor are largely unknown. Acquisition of the required data is possible by well-known methods but the job is lengthy.

Radiations incident to the process of nuclear fission pose a large number of new problems for the engineer. The need for adequate shielding for operating personnel has been mentioned many times. This problem is more complex, however, than may be first realized. Consider, for example, the probable electric-power generating system. Heat generated in the reactor is transferred by a suitable gas to a heat exchanger in which water is boiled to produce steam, for use with a conventional turbine generator. The possibility of leaks through which radioactive material might pass poses a serious problem.

At first glance it might be assumed that the only radiation problem is that concerned with the reactor. However, this is not the case. The gas coolant itself may become radioactive and in addition probably would gather other radioactive substances such as dust from the reactor. Presumably the heat-transfer unit in which steam is formed is such as to prevent transfer of radioactivity to the steam by direct radiations. However, a leak would permit radioactive material to contaminate the steam. Depending on the magnitude of this effect, it might be necessary to shield the turbine and piping also. Obviously this is undesirable.

Continuous operation of a nuclear power-generating equipment is desirable if not essential. This means that the "fuel" must be replaced at intervals during operation. Because of the intense radiation within the reactor, extraction and replacement of fuel can be accomplished only by devices remotely controlled. The detail problems connected with the mechanical design of such devices are determined by the particular requirements of the reactor with which they would be associated. However, several general types of problems arise. Presumably the fuel will be distributed throughout the reactor, therefore the device must be so designed as to permit selection, removal, and replacement of fuel elements in any section. The device itself will be continuously bombarded by radiations so that it in turn becomes radioactive. This suggests the impracticality of servicing the device once it has been placed in operation. Trouble-free operation will require extreme care in design.

Factors such as the effect of radiation on lubricants are at present unknown. These must be determined prior to the use of lubricants with the equipment. Also, assuming that it will be found desirable to have electrical elements in the fuel-handling equipment, their reaction to radiations must be fully explored. For example, it would be fatal to use equipment in which the electrical insulation deteriorates under long-continued radiation bombardment.

Another matter is important, although little has been said regarding it. For many years radiations such as x-rays have been known to affect the properties of certain materials. For example, crystals of potassium chloride change color under x-ray bombardment but return to normal upon removal of the radiation. Radiations within a nuclear reactor are many times more intense than any previously available. The possible effect of such radiations upon the crystal lattice of materials used in a reactor when exposed continually for long periods of time is yet to be determined. It is likely that the properties of materials will be altered sufficiently to bear on their suitability for use in a reactor. This problem rests today in the hands of the research worker.

The foregoing has touched on some of the problems that become apparent when one considers the application of atomic energy to generation of electric power. Many will require additional knowledge, to be obtained by fundamental research work, before the engineer is able to tackle the design problems to be expected.

The speed with which these and other problems are solved depends, obviously, in large measure on the number of men that can be applied to the work. Most of the fundamental work will have to be done by nuclear physicists and chemists working in government and industrial research laboratories. However, as these men progress with their work many problems will arise that can be turned over to engineers and scientists not necessarily specialists in the field of nuclear physics. Members of the Atomic Energy Commission have recently stated their realization of this possibility and propose to take advantage of it.

This is indeed encouraging. If the limited pool of nuclear physicists and chemists now available had to do all the work necessary for the practical application of nuclear energy in the electric power field, many years would pass before the first demonstration could be made.

There is indeed a big job to be done, so big in fact, that one could not be blamed for being pessimistic about the possibility of a successful outcome. Nevertheless, the realization of the magnitude of the job and the steps being taken to put adequate manpower to work on it gives assurance that the necessary research and development will be done and done in as short a time as can reasonably be expected.

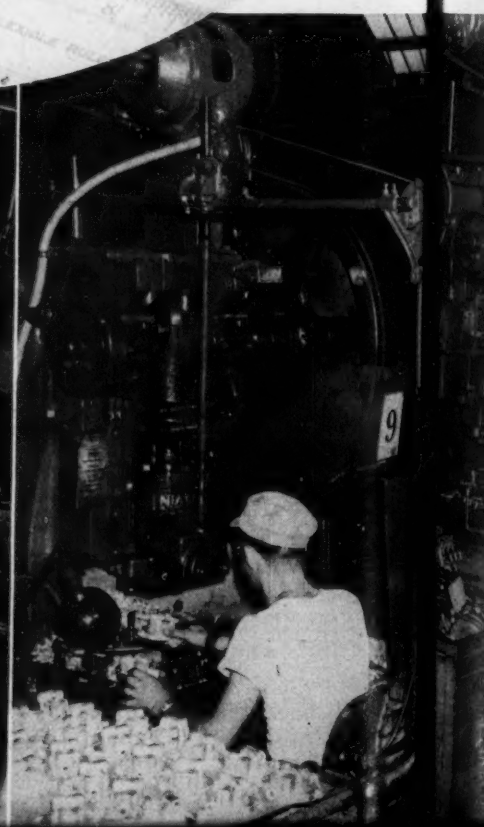
MODERN Die Casting

By R. J. REEL
Die Casting Engineer
Hydraulic Press Mfg. Co.
Mt. Gilead, O.

Fig. 14 — Battery of cold chamber die casting machines designed for mass production of large aluminum and magnesium castings. Due to size and complicated coring of castings being produced in this department, each machine is served by two operators. Courtesy The Hoover Co.

Fig. 15 — These zinc faucet handles, cast with an H-P-M submerged plunger type die casting machine, depict a typical multiple cavity casting. Note the overflow wells which also serve as bearing points for the ejector pins

Fig. 16—View of a modern casting trimming department which illustrates use of punch presses for flash, runners and gate removal. Courtesy The Hoover Co.



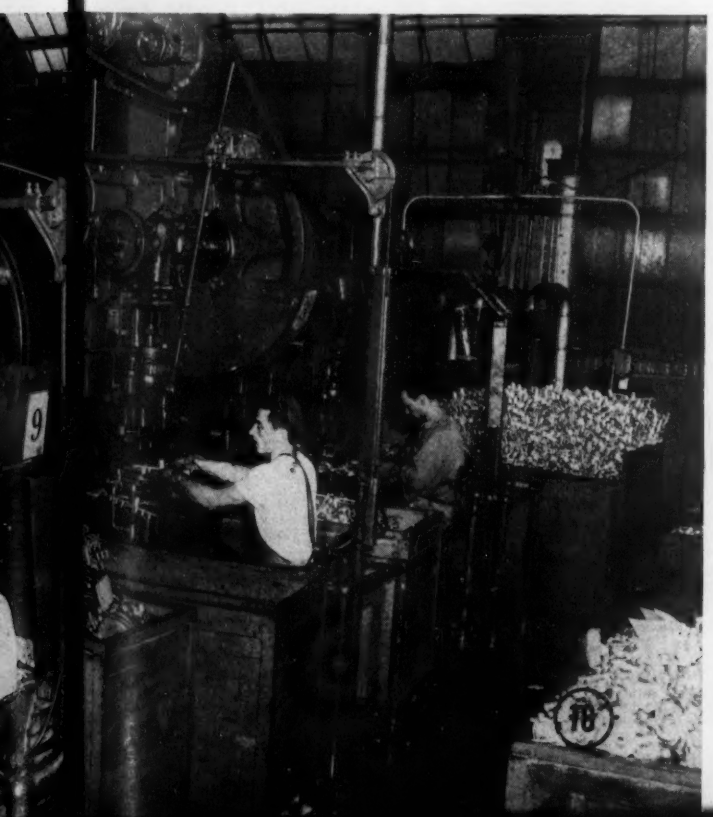
Concluding the series, this fourth article covers die materials and flash removal and takes a look at trends in applications of the process

...Practice

MATERIALS used in die construction include wrought alloy steels of many different analyses. The metallurgist of die casting companies are not in complete agreement as to the best steels for specific uses. Although unhardened mild steel can be used for die casting lead and tin alloys, and for short runs of zinc alloys, it is better practice to employ die steels that are surface hardened to resist the wear, metal wash, and the hammering action incident to normal use.

Some zinc die casting dies are made of steel purchased in prehardened condition (190 to 300 brinell) even though this steel is harder to machine than softer grades. When prehardened steel is used, the subsequent hardening, with possible dimensional changes, is avoided. Most dies are pack hardened after machining.

Dies intended for aluminum alloys are satisfactory for making zinc castings but the reverse is not always true, unless a good steel has been used and the difference in shrinkage is not important. As in all forms of casting, allowances must be made for shrinkages in changing from the liquid to the solid state and in cooling after solidification, the amount varying with the particular alloy being cast. Solidification shrinkage for zinc alloys is 0.14 to 0.15-inch per foot; for copper alloys, about 3/16; for aluminum and magnesium alloys about 5/32.



All dies for casting aluminum, copper and magnesium alloys should be hardened and be made from a steel that is highly resistant to heat checking resulting from thermal shock and to the erosive or solvent action of the molten alloy. Since copper alloys are cast at higher temperatures than aluminum alloys, only high-alloy heat resistant steels that are heat-treated are suitable.

An ideal die steel should be dimensionally stable, resistant to heat checking, hammering action, erosion, corrosion, soldering to the alloy to be cast, and mechanical wear; capable of heat-treatment to satisfactory hardness, readily machinable in either the annealed or in prehardened condition. Few die steels possess all these qualities in the desired degree, hence the choice involves the best compromise that will meet the particular conditions to be encountered.

Well made properly hardened dies for zinc alloys are good for one million or more casts without significant attack by the molten alloy, although mechanical wear, especially on cores and parts having relative motion, does occur. Dies for aluminum alloys have made as many as 100,000 to 250,000 casts without renewing the cavity blocks but some redressing may be required, together with corresponding dimensional changes. Degree of smoothness of castings obviously decreases as checking occurs. Cores may have to be renewed and the effects of mechanical wear corrected during this period.

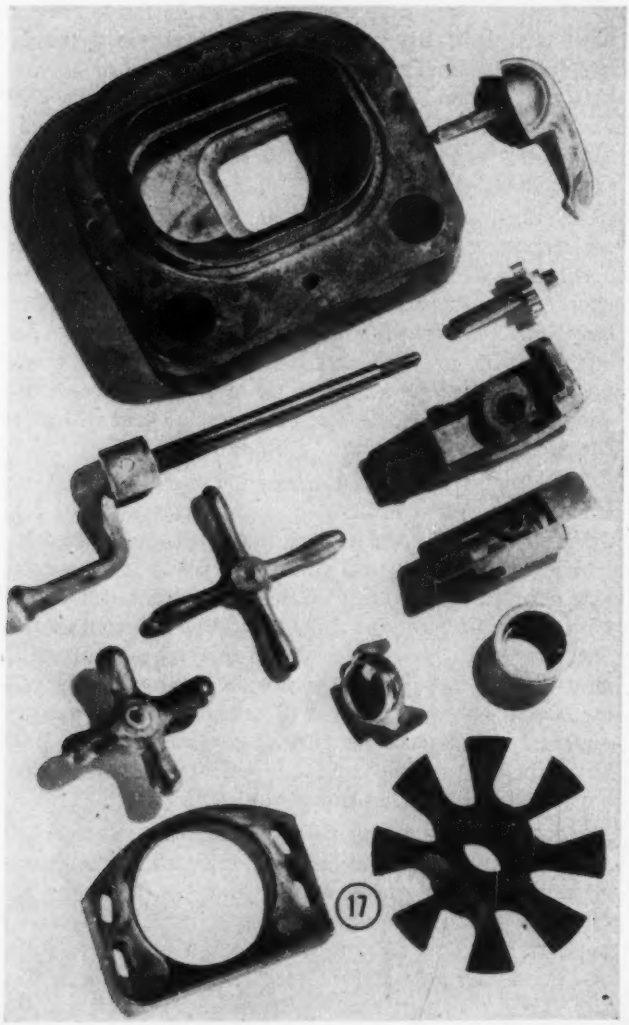
Heat checking of die steels, encountered when casting the higher melting alloys, ultimately results in cracks of considerable depth, and the pressure applied to the molten alloy forces it into these cracks so that raised veins appear on the castings and the casting become harder to eject. Veins do not injure the casting, except that it becomes rougher and the veins are detrimental to appearance. They can be ground or machined off, if the added labor is justified.

Some metallurgists recommend "hot work" die steel containing about 5 per cent chromium, 1 per cent molybdenum, about 1 per cent silicon and 0.5 per cent manganese. This steel is heat-treated after machining and the cavities may have to be ground to final size, after hardening. Such steel serves well for either long run dies for zinc or for die casting aluminum alloys. Others make use of steel with only 0.30 to 1 per cent chromium and find it suitable for zinc alloys.

Dimensional changes in the heat treating of dies can be minimized by slow heating. The minimum heating time recommended is 90 minutes per inch of thickness of the die, plus that of the material in which it is packed. Tempering should follow quenching and cooling, to a temperature permitting handling with bare hands. The tempering furnace should be at 200 to 400° F before dies are put in, and the dies should

not be quenched after tempering. Tempering temperature should be that which yields the degree of hardness which experience indicates is best.

The foregoing information on die steels applies primarily to die blocks in which the cavities are integral. As previously indicated, cavity blocks can be pressed into holders and, as the latter are not subjected to thermal shock and erosive action as are the cavity blocks themselves, the holders may be made from softer, less expensive steel.



Since cores are commonly subjected to maximum temperatures and seldom can be directly water cooled, they are likely to attain temperatures even higher than cavity blocks. Cores are also subject to mechanical wear and sometimes to a galling action as the casting is forced off the cores, after shrinking thereon. Hence, cores should be made from steel at least as heat and wear-resistant as the cavity blocks themselves. Die construction should also be such that the cores can be easily replaced, when necessary. Some cores, even for dies used for zinc alloys are made from stainless steel.

Flash Removal—Most die castings cannot be used without first removing flash, which is done after cutting or breaking the casting from the gate. Any special tools used for flash removal are usually designed with the dies and the cost thereof is added to the total die cost.

For some castings, no special flash removal tools (trimming tools) are required, when the flash is so located that it can be cut off during a machining operation. With most castings, however, the flash is sheared off in a trim or shaving die made to fit the casting contour at the flash line and is used in an ordinary punch press, arbor press, or kick press. The casting is either pushed through a fixed die or is held on a bed or fixture, while the die is lowered, by the press, to shear the flash.

Usually, the trim die is merely a plate of hardened tool steel having a hole which makes a close fit to the casting, at the flash line. The hole usually has a land of about ⅛-inch and is relieved for the balance of the plate's thickness. To keep the cutting edge sharp, the face of this plate is ground from time to time. Often such a die includes one or more punches, to clear flash from cored holes or even pierces holes in thin sections, at same time contour flash is sheared.

Such flash removal is rapidly done and the tools used are moderate in cost, especially if the casting has flat parting. If the parting is not flat but irregular, and some flash is at an angle to other portions, the die becomes more expensive, or two dies may be required. If a slide or (*Please turn to Page* 114)

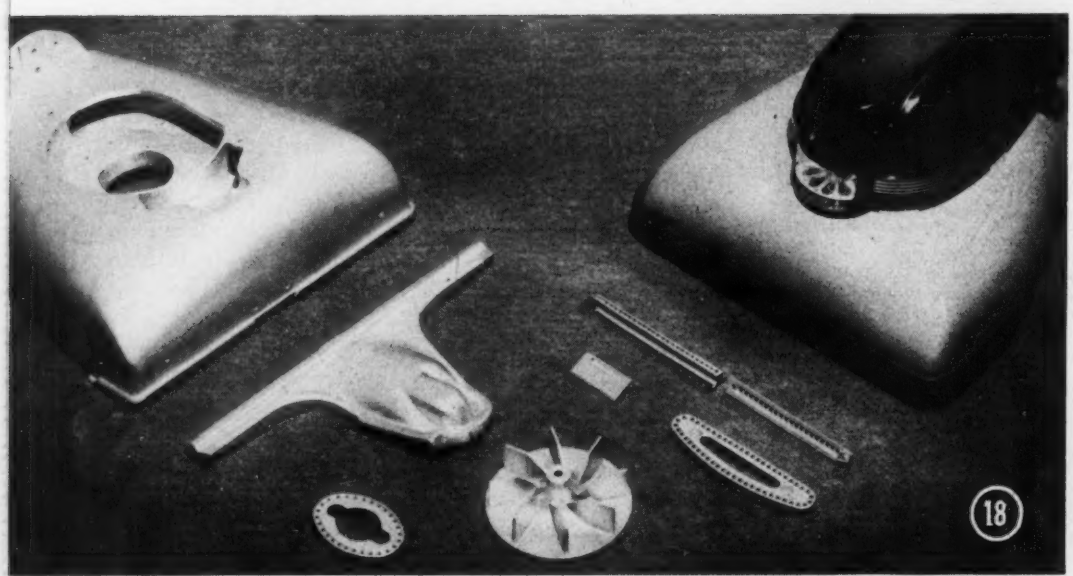


Fig. 17 — *Representative group of brass die castings produced by the cold chamber method. Castings made from copper alloys have unusual strength*

Fig. 18—*Eight die castings are used in the manufacture of the Hoover vacuum cleaner. A majority of these castings are made from aluminum alloys. Parts range from the main casting weighing* 5 *pounds to those weighing a few ounces. Courtesy The Hoover Co.*

Fig. 1—Electric bonding surface preparation of automotive crankshaft prior to metallizing. A nickel-iron electrode is rubbed across surface to be sprayed. Small particles of the electrode are fused into the surface, producing a roughened crater-like effect

Preparing Surfaces FOR METALLIZING

By RICK MANSELL

To insure that the coating will adhere permanently, blasting, rough threading or electric bonding methods are used to clean and roughen surfaces for metal spraying

IDEA of spraying an atomized stream of molten metal upon a surface so as to produce a metallic coating upon that surface occurred to Dr. M. H. Schoop of Zurich, Switzerland in 1909. The original wire gun was developed before the first world war. It was really a fine mechanical piece of work, so much so that the basis of operation of the modern wire guns remains substantially the same as the original design. Our present day equipment is better, faster and more economical, but all these improvements have been the result of refinement in design, rather than a change in operating principle.

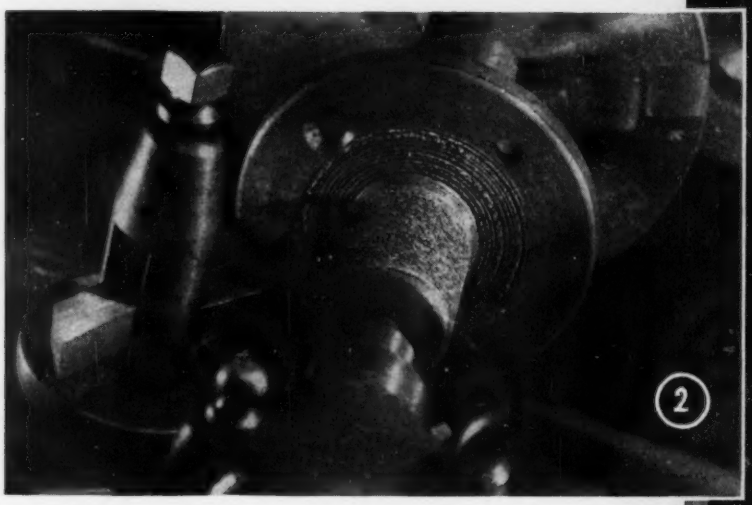
First application of metal spraying was as a means of protecting surfaces against various types of corrosion. It was also used to a very limited extent for decorative purposes. A major advantage of the process was the fact that there was no limit to the size of the structure which could be coated. Before 1930 the process was used more extensively in Europe than in the United States. However, after that date, the use of metal spraying rapidly increased in our country, until today it is an important factor in almost every branch of our industrial operations.

Metallizing has firmly established itself in the mechanical field. There is the ease and speed with which machine element parts can be repaired. The savings involved are considerable and in many cases properties of the sprayed metal coatings are actually superior to the base metal in its wearing qualities, even though it is of similar composition. Furthermore, the metallizing process has been used to coat an expensive metal over a more common metal base, so as to produce the properties of this expensive metal without having to use it completely as a solid core.

Preparing the Surface for Bonding—Before the process of spraying the metal is commenced, it is necessary that a preliminary operation be performed to clean and roughen the surface. This is required to insure that the coating will adhere permanently after it has been sprayed on. There are several methods which have been used to accomplish this result. As usual, the method selected will depend upon the circumstances involved as well as upon the individual judgment of the engineer. It will be influenced by the size and shape of the part to be metallized and will also depend upon the available facilities. There are three main methods of surface preparation of interest to the maintenance engineer: Sand and grit blasting, rough threading, and electric bonding.

It is always essential that the objects to be metallized be quite clean. Thus in the case of a cast iron piece which has been running in oil, it is natural to expect that there will be a considerable amount of oil absorbed in the pores of the metal. This oil will prevent the creation of a satisfactory bond and neither rough threading nor grit blasting will remove it from the surface. Such parts should therefore be subjected to high temperatures, in order to drive off the oil from within its pores.

In the case of those hardened surfaces which tend



to make the machining operations rather difficult to perform, it is suggested that the parts be first annealed. If the sprayed coating is composed of Tufton chrome steel, 1.20 carbon steel or a No. 2 stainless steel, then it will not be necessary to follow by rehardening operation, since these metals themselves provide a hard tough surface.

Occasionally, special bonding methods are employed. A shaft or flat surface is first cold tinned before the application of spray-on tin, lead, zinc, or bronze coatings. On other occasions, air chippers have been successfully employed to prepare a flat surface to receive sprayed steel.

Blasting Methods of Surface Preparation — The term "blasting" is used to describe the process of pressure projection of abrasive material against the surface of objects in such a way as to roughen those surfaces. The degree of adhesion of the sprayed metal will depend upon this surface condition and there are some types of surfaces which in their original condition are sufficiently porous to be able to receive a sprayed metal coating on top of them without any previous preparation. However there are many more surfaces to which the sprayed coating of metal will not adhere unless they are first roughened and cleaned.

Such a roughened surface is full of minute fissures and crevices into which the molten particles can lock themselves as the coating is applied. Furthermore, if this roughened surface is obtained by blasting, then it automatically will be free from dirt, oil moisture, oxides, and other undesirable surface impurities. All of these foreign materials will tend to diminish the adhesion of the metal coating, and hence their removal is very necessary.

It is very fortunate that most of the surfaces usually encountered in the industrial operations can be blasted fairly easily and rapidly. All that is required is a source of plenty of clean air and a good high pressure blasting machine. In addition, the correct type of abrasive has to be selected to suit the requirements of the situation. There are a number of different abrasives which can be used and their selection will depend upon the nature of the job to be done. It has been found by experience that both hard angular sand and angular steel grit are very satisfactory materials.

Blasting sand used must be hard and its grains possessing angular and not round faces, in order to effect the appropriate surface preparation. As a general rule, the usual grades of silica, flint, or garnet sand will meet these requirements. The ordinary variety of sand such as is used for commercial sand blasting and cleaning purposes is not really suitable for use as a surface preparation prior to metallizing. This is because it breaks up too rapidly and does not produce a surface which is adequately roughened for the job.

Mesh Limits—For most of the jobs in the average metallizing shop, it will be found that a 16 to 20 mesh sand is perfectly satisfactory. The grains of these mesh limits are found to be large enough to cut well, and in addition their volume is sufficient that the blasting procedure can be conducted in a fairly rapid fashion. While it is true that sand of a smaller range of mesh size, is able to clean the surface in a faster manner; it is also noted that these grains are too small to roughen the surface sufficiently, to provide the required key for adhesion. As a general rule, the sand can be reused for two or three blasting operations, if the precaution is taken to screen the dust and to re-

Fig. 2—Lathe operation showing rough threading of a difficult-to-get-at surface. Molten metal is then forced into the recesses. Cooling locks metal firmly to surface producing a permanently tight bond. Courtesy Metallizing Co. of America

Fig. 3—Sixty-inch hood machine used for cleaning metal surfaces before spraying with metal coatings. This unit has a rotating table controlled by a hand wheel in front of the operator. Courtesy Ruemelin Mfg. Co., Milwaukee

move all the fines from it.

Angular steel grit is found to be a very satisfactory abrasive for the surface preparation of metals prior to the application of sprayed coatings. Apart from the economy in the use of steel grit, there are other advantages associated with it. For example, it generates practically no dust of its own during the blasting operation and so creates a comparatively dust free surface. Steel grit should be screened regularly so as to remove any dirt or small worn-out pieces of grit which have no useful function.

Grit Size—Although angular grit can be obtained in a wide range of sizes, it must be remembered that only a few of these sizes are useful for the purpose of surface preparation prior to metallizing. The smaller grains will blast the surface more rapidly, but they will not roughen it to the same degree as the larger sizes. With the average types of work to be sprayed, it has been found that a mixture of equal parts of the No. 30 and 40 grades will produce an abrasive mixture the action of which will result in a very satisfactory surface.

In the case of machine element coatings where the surface cannot be prepared by the more usual rough threading method, then best results are obtained by using a No. 15 or 20 steel grit. This consideration applies to certain types of crankshafts, lathe beds, cylinder liners, and hardened objects. In the case of light fragile pieces which possess thin sections, or for pieces which might easily be distorted by the blasting process, then a fine grit should be used, such as the No. 60 type.

Apart from the selection of the right type and nature of abrasive, it is also necessary that an ample air supply be available both in volume as well as in pressure. The air that is used should be clean and free from such impurities as moisture and oily vapors. Presence of dampness in the air supply will cause the sand to cake up and will also cause the mixing chamber to be clogged up. Moisture will also cause steel grit used to start rusting. Presence of oil in the air supply will cause the base metal to be covered with a film of greasy compounds which will prevent the adherence of the coating metal, irrespective of the existence of a well-roughened surface.

Air Pressures—There are no set rules which can be presented as to the correct air pressures which are required for the blasting operation. These will vary from 30 to 100 pounds per square inch. The hard castings, such as those of iron and steel will require higher pressures, while the softer metals as aluminum, zinc and lead can be blasted at much lower pressures. In addition, the shape and detail limitations of the work to be blasted will determine the sort of pressures to be selected.

Iron and steel castings will require a pressure of at least 80 pounds per square inch; this applies to steel plate as well as to rolled shapes. In the case of aluminum, a pressure of 60 pounds per square inch is ample and in addition a lighter abrasive can be used. When blasting a galvanized surface, the pressure must be greatly reduced and a finer abrasive used. This precaution is very essential, because the use of a too heavy blasting may quickly loosen the galvanizing from the iron and will cause it to blister away from the base metal.

If large areas of light weight metal are blasted with coarse grit and with high air pressures then there will be the danger of warping and buckling. Even flat plates as heavy as (*Please turn to Page* 119)

Skilled Die Making Permits INTRICATE DRAWING of Integrator Housing

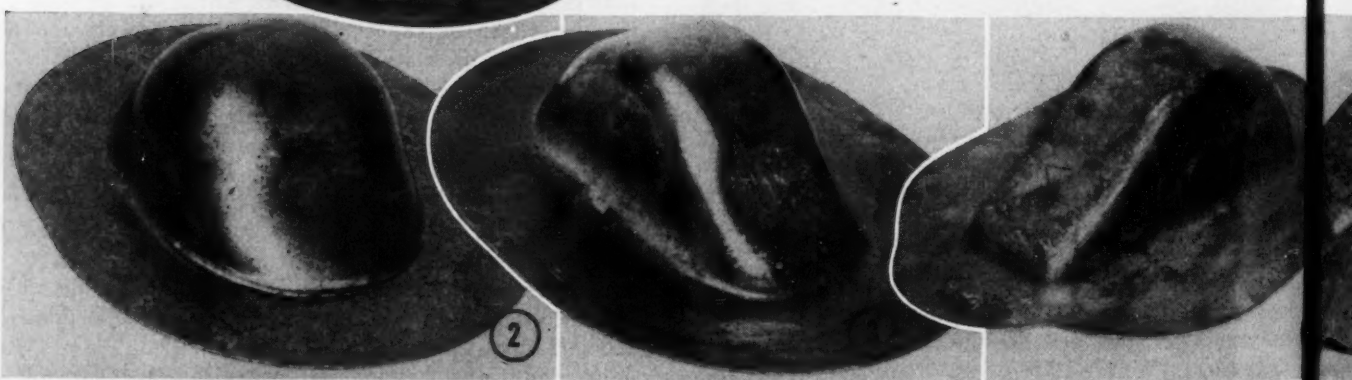
ONE of the outstanding examples of how manufacturers are overcoming production difficulties and bettering product quality is exemplified in the accompanying scenes taken in the plant of Bailey Meter Co., Cleveland. Here die making ingenuity, coupled with a specialized apprentice training program, is making possible the stamping and forming of many intricate sections which are components of the hundreds of recording instruments, meters and controls manufactured for power and process industries.

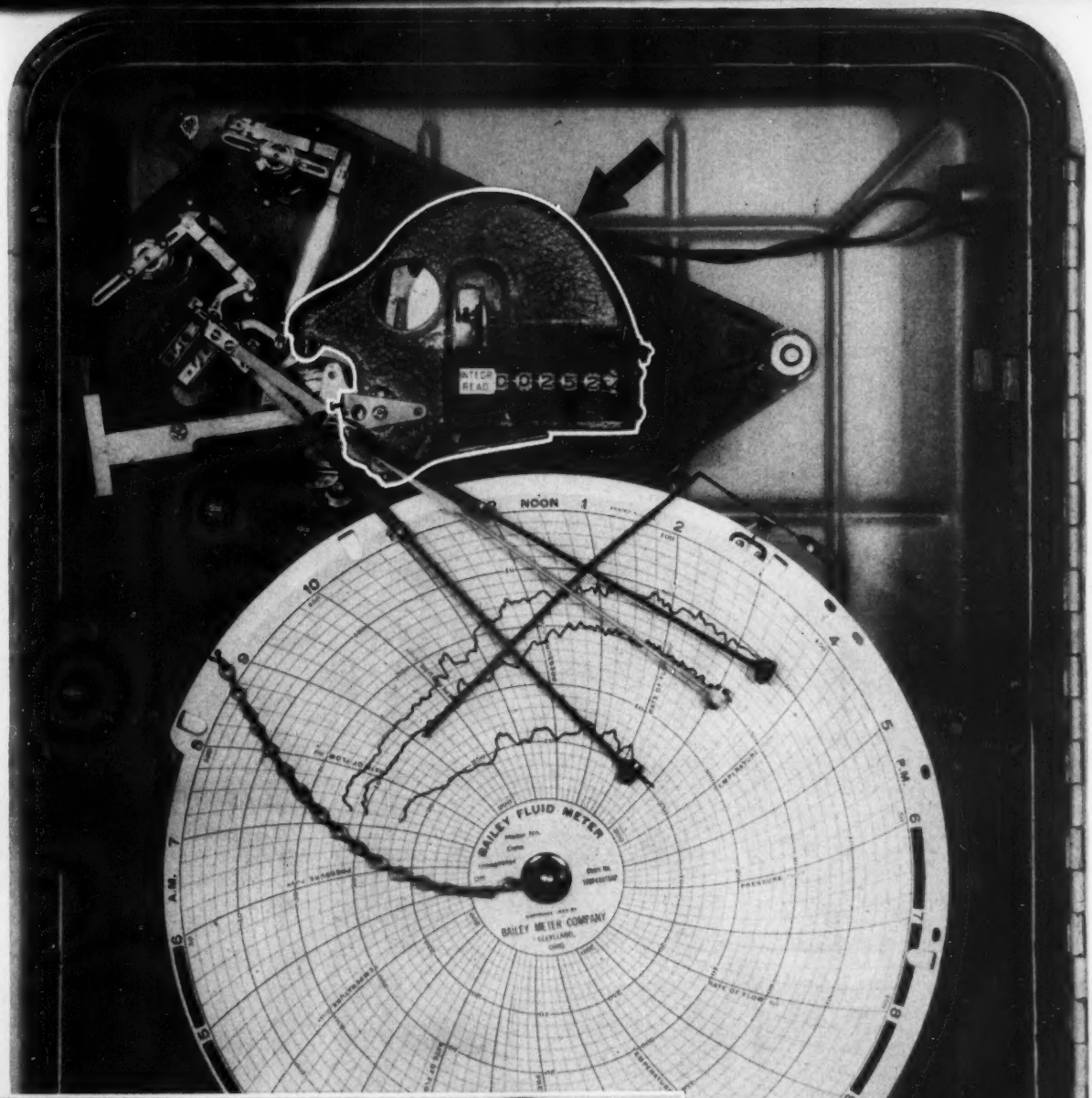
Fluid meters manufactured here record and integrate the flow of steam, water, compressed air, gas and other fluids. Pressure and temperature recorders may be included to record on the same 12-inch uniformly graduated chart with record of flow synchronized so related factors such as steam pressure and steam temperatures may be readily compared with steam flow. This type meter is used with turbines.

Production of the housing for the sturdy, escapement type integrator which may be compensated for variations in pressure and temperature, is performed wholly within the above plant. First, a blank of 16 gage deep

By DAN REEBEL
Associate Editor, Steel

Photography by the author

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BAILEY FLUID METER
BAILEY METER COMPANY
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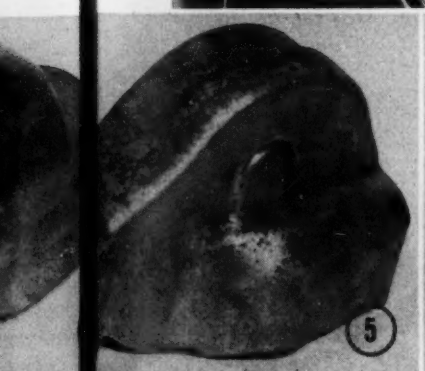
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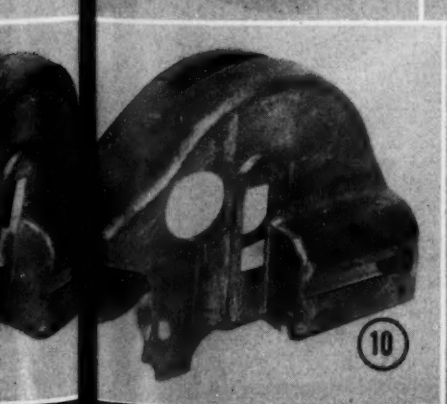
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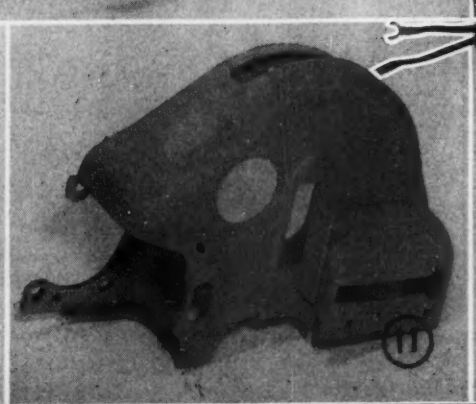
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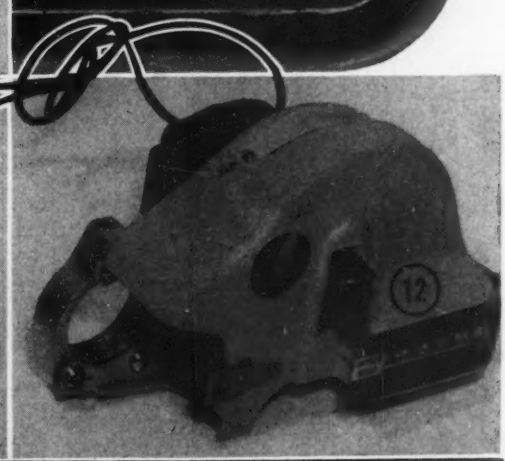
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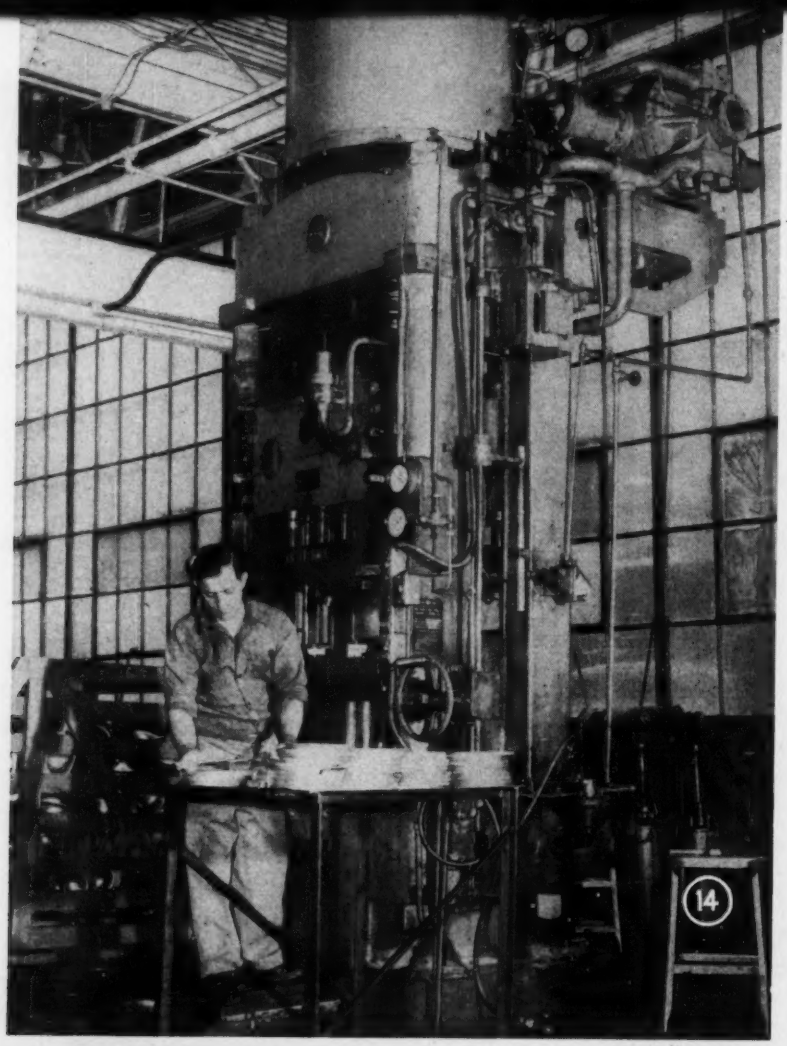


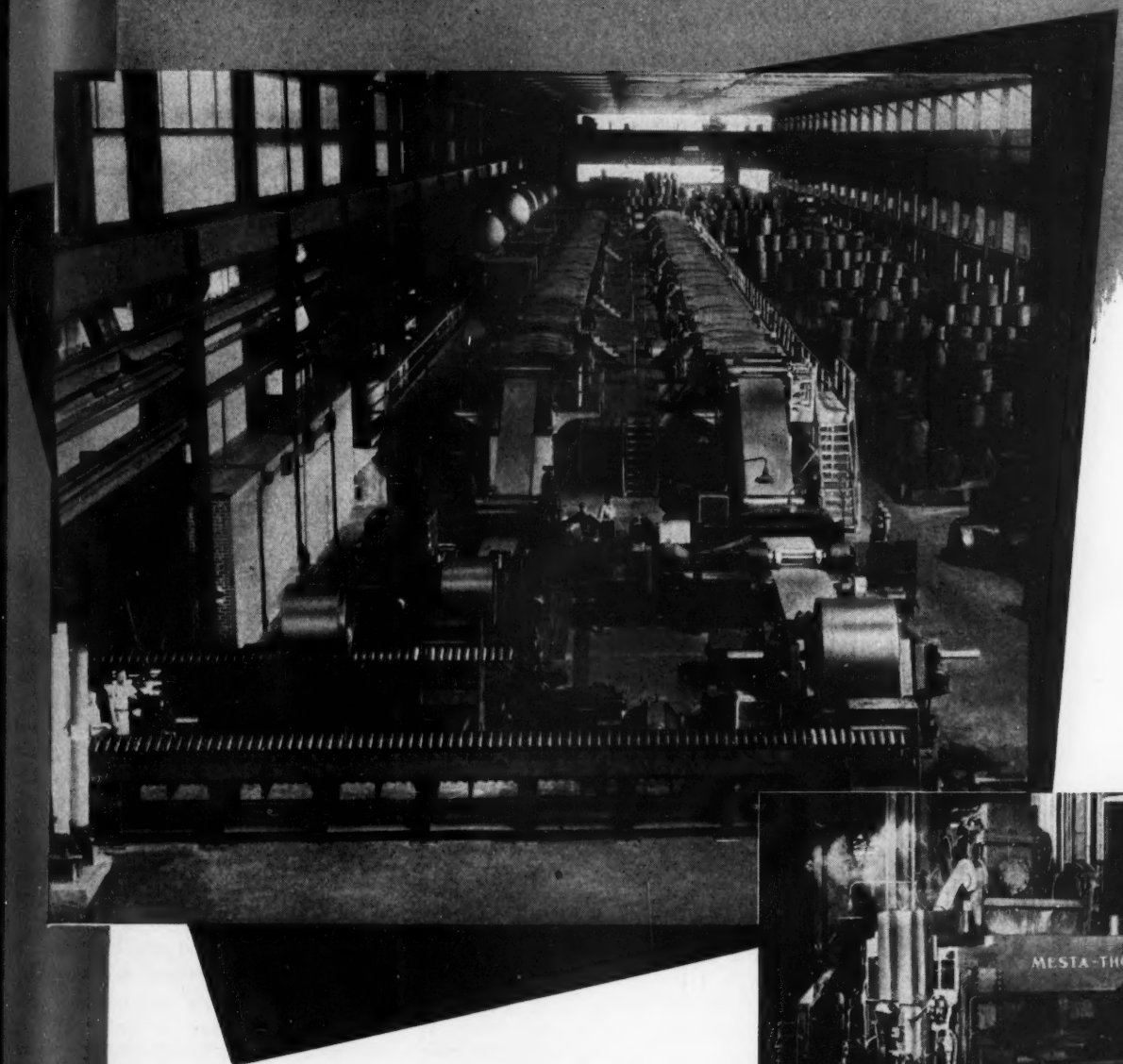
drawing sheet steel of approximately 11 inches in diameter is given the first draw in a 150-ton capacity press. Manufactured by Hydraulic Press Mfg. Co., Mount Gilead, O., the press, shown in Fig. 14 and also in the close-up in Fig. 15, produces the piece as shown in Fig. 2. The entire process consists of seven drawing operations. The piece is annealed after the first draw, then reduced twice and further annealed. Prior to the final drawing, another annealing takes place, thus assuring good physical properties in the finished integrator housing. An ironing out operation is performed after the fourth draw. Sequence photographs, Figs. 2 through 10 inclusive, show the piece in various stages of its production. Figs. 11 and 12 show the housing after finishing and assembling with the integrator mechanism. The finished integrator and its housing as finally installed in the Bailey fluid meter is shown in Fig. 13.

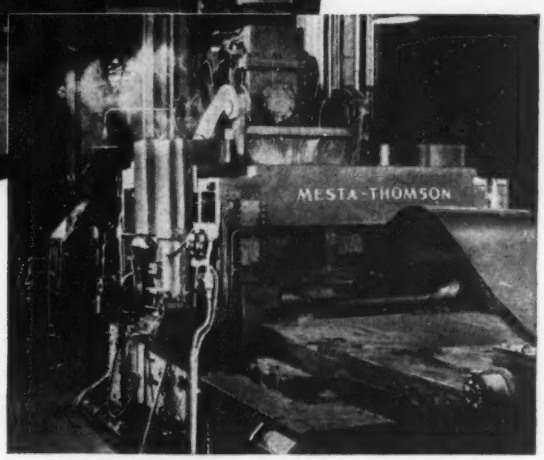
Drawing dies are made of tool steel or low carbon steel which is subsequently carburized. No cast dies are used for this integrator housing.

The sections are annealed by passing them through a continuous furnace held at a temperature of 1450-1500°F.

Continuous Pickling Lines

built by MESTA





The Mesta-Thomson Flash Welder, located at the entry end of continuous pickling lines, produces heavier coils with butt welded joints suitable for cold rolling on high speed mills.

A Mesta Continuous Pickling Line delivers greater tonnage of strip steel. This is due not only to the design and sturdiness of the individual units, but also to correct engineering of the entire process.

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY • PITTSBURGH, PA.

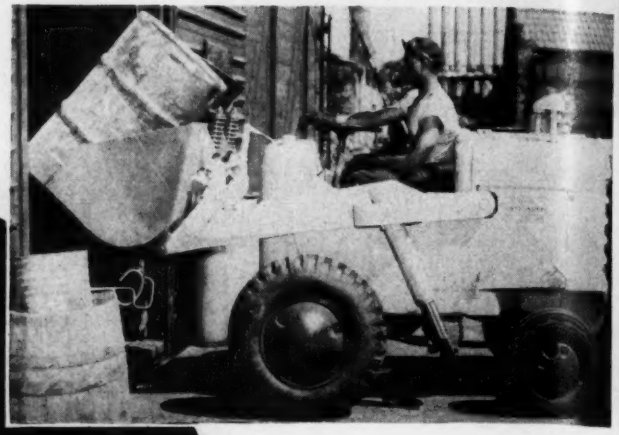


Fig. 1 (left)—Loading foundry scrap to charge boxes. One Payloader loads a 4000-pound box in 3 minutes

Fig. 2 (above)—Unloading barrels of scrap from box car. Each barrel weighs 600 pounds

Brass Smelting Speeded

. . . by new materials handling methods

SOME of the largest capacity smelting furnaces in the country are in 24-hour operation at the North Chicago plant of North Chicago Refiners & Smelters Inc., where materials handling problems have been reduced by the use of two power trucks. When the first of the two Payloader trucks, manufactured by Frank G. Hough Co., Libertyville, Ill. was put into operation, it was used to handle scrap and furnace flux. With the second truck in use, the two units are utilized in practically every step of this smelting process from unloading scrap to piling the finished ingots.

Four of the furnaces operate around the clock, each pouring 100 tons every 24 hours. It takes 100 men working a six day week to keep the furnaces filled with scrap metal. The finished products, brass and bronze ingots each weighing 23 pounds, are sold to nonferrous jobbing and production foundries throughout the country.

As the scrap metal arrives at the factory, the Payloader starts production by unloading and transporting scrap to storage bins where it is piled for future use. This unit, operated by one man, unloads a 50-ton box car filled with loose bulk or barrel type scrap metal in 3 hours. This is a job that formerly took three men 8 hours; new handling method results in the saving of 21 manhours per car. When the scrap comes in barrels, each one weighs 600 pounds; to expedite production, two are handled at a time.

Second step in the production of ingots is to load charge boxes with scrap from the storage bins. Equipped with a 48-inch bucket which has a 12 cubic foot capacity, the machines are very adaptable for this type of work. Each charge box holds 4000 pounds and can now be loaded in 3 minutes. This job formerly took two men 15 minutes. Before the arrival of the model HA Payloader, when charge boxes were loaded en masse, it took two men 4 hours to load ten boxes; the same job is now done by one truck in 30 minutes.

Once the scrap has been dumped into the furnaces, fluxing materials must be added to withdraw impurities. Each bucket full of flux dumped into the charge boxes weighs 1000 pounds.

Periodically in the smelting and refining operation, furnace slag must be withdrawn from the molten metal. When it has cooled and hardened, it is transported to outside storage piles.

A circular track carries the molds of ingots through a water cooling system and then a conveyor takes them to the stock room. In this final operation, the Payloaders are used to pile ingots in huge stock piles prior to shipment. Due to the weight and density of the ingots, this is the most severe use to which the machines could be subjected.

Under the heading of miscellaneous uses, the trucks also handle coal for the furnaces; in the winter they are used for snow removal. Handling everything from the fine copper wire to 23 pound bronze ingots is all in the normal day's operation.

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The Modern Electric Resistance Welded Steel Tube

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- **WEIGHT**
- **DUCTILITY**
- **I. D. *and* O. D.**
- MACHINABILITY
- WELDABILITY

Today — when every manufacturer is seeking shortcuts in production and additional economies that will permit an equitable price reduction, many small shops and large factories are turning to electric resistance welded tubing as the low-cost solution to their fabricating problems.

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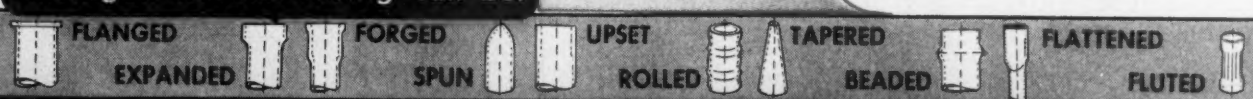

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Fig. 1 — First draw operation of 3-quart saucepan showing stamping being ejected from die, and blank about to be inserted. Note chute arrangement for passing stamping to next operation

Fig. 2—Close-up view on forming vapor seal groove on top edge of saucepan

Fig. 3—Beading saucepan rim

Closely-Controlled

By GERALD ELDRIDGE STEDMAN

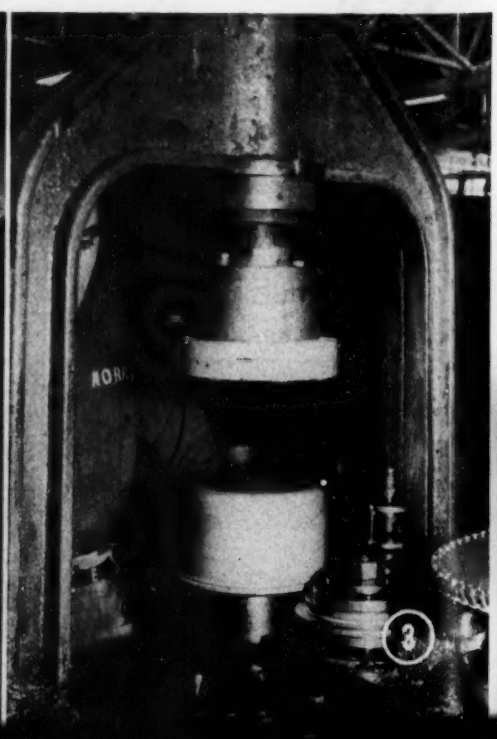
FORMING OPERATIONS

Used To Fabricate Copper-Bottom Stainless Containers

LATEST stamping, forming, drawing techniques, controlled by a direct accurate routing system are used in the manufacture of a great variety of metal parts at the Los Angeles plant of Norris Stamping & Mfg. Co. Bath tubs from sheet steel, automobile wheels in conveyorized line flow, tubs, skirts and spinners for washing machines, dispensers, collapsible spouts, aluminum powder boxes are fabricated here. A great part of the company's production is on contract, but it produces a copper bottom stainless steel line of cooking ware on its own marketing account.

This line consists of 14 items, such as pans, pots, kettles, skillets, dutch ovens—most of them covered and employing a vapor seal principle. The pieces have plastic handles and knobs, diametric proportions, streamlined design, balanced weight, copper bottoms. Its production incorporates many good methods.

Type 302 in 0.023 and 0.025 grades of 18-8 stainless steel is the cookware metal used in the production of the 3-quart saucepan and cover. Steel bought in coiled stock of 2500 pounds maximum, in strip widths to accommodate the variety of utensils being formed, is received in car-



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We hear manufacturers tell the same story every day, here at Gensco.

"WE CAN'T BUY STEEL TO MEET SPECIFICATIONS!" they complain.

"Look," we explain, "go ahead and buy your steel in *off sizes*. We'll whip it up to suit your exact needs in *no time*."

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If you're one of the many who has been forced to buy steel "catch as catch can" . . . call or write Gensco. A competent Sales Representative will give your special problem thorough and immediate attention.

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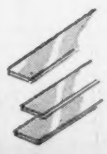

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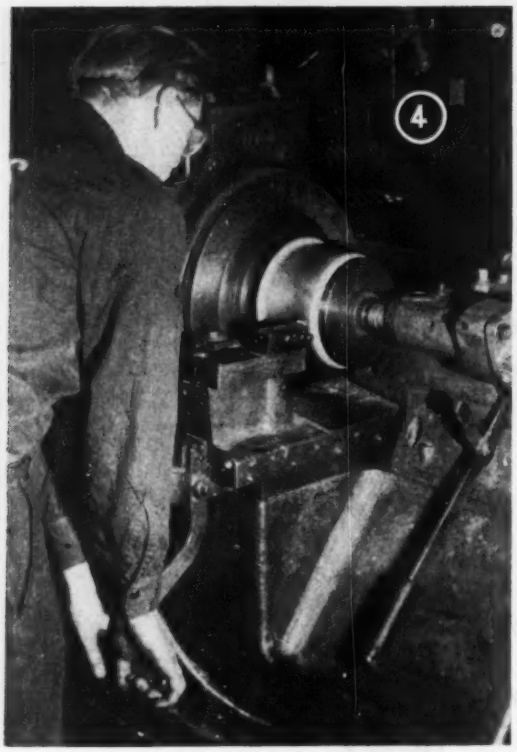


Fig. 4—Copper plating trim operation on automatic Coulter lathes

loads and run into storage area. Western manufacturers, because of the distance from supply sources, are forced to carry a somewhat heavier inventory than firms that are located closer to steel centers.

Simple Scheduling System — Norris has a simplified, highly accurate production scheduling system, geared to hourly changeovers, and with close materials control. The cookware department receives press work and plating operations which must be scheduled simultaneously and kept in instant balance. Most of the ware involves matching covers which must meet package timing on the minute. All this demands close scheduling.

When the 3-quart saucepan and cover appears on scheduling time table, stock in coils is withdrawn and moved to blanking press by a fork truck. First work is done on a No. 28 Bliss open back, inclinable 88-ton press. The coil, 24-inch maximum width, is loaded on an automatic strip feed and comes through the blanking die. This particular work is 13 5/8-inch diameter blank. Wherever possible, staggered double blanking dies are used. Two such pieces can be secured by that alignment from 24-inch stock. By castered boxes the work comes next to draw press.

Drawn in One Operation—Blanks are passed between oil rollers at the draw press and are then fed and drawn in one operation, using a 200-ton Verson mechanical press of 30-inch stroke and making 600 hits per hour maximum. Total draw is 5½-inches, leaving a 1 inch to 13/16-inch flange. Presses concerned in this routing are all close together. Work travels from one to another by chute, the operator shoving pieces along.

Next operation trims the flange, leaving sufficient stock to form the vapor seal grooving, a feature of the cookware line. This trims to ½-inch flange and is performed on a No. 305 straightside 100-ton Bliss at same production rate of 600 per hour.

Drawn and trimmed stainless pieces are moved 6 feet by chute to another 100-ton Bliss of identical type which forms and nips the rim, putting in the vapor seal indentation and turning the remaining flange under, preparatory to beading. The work then flows by chute to beading operations.

Beading is accomplished on a 30 x 30-inch table, 36 inches high, equipped with beading machines of Norris design. On this steel table, two 15 horsepower motors plus a small gear reduction motor are mounted. The large motors drive the plate on which the saucepan is mounted, rotating the work at 3000 revolutions per minute. The small motor drives a cam that actuates the beading roll, pushing against the rim of the pan and retracting automatically. Machine action is by button control with the operator's hands clear.

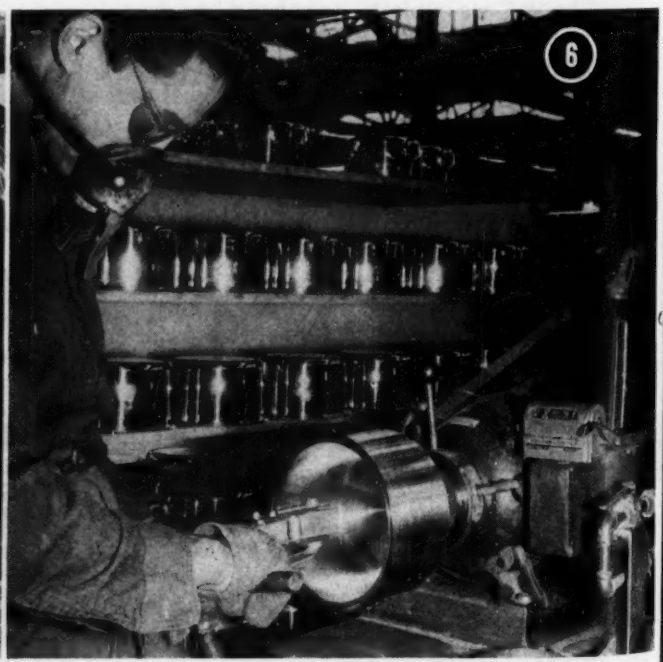
Work is set on the plate and held by air cylinder which is electrically actuated, pushing the plunger down to the inverted bottom of the saucepan in work. This plunger is cork lined, held at 60 pounds pressure to the pan bottom, holding its position to the plate to complete press action.

After beading, the work receives an alkali wash to remove drawing lubricants in a Metal Wash Machine Co. continuous spray washer. Work sitting on woven wire conveyor is washed and rinsed in the same machine, two tanks and pumps accommodating the two sections. Work is then discharged to tote boxes and moved

(*Please turn to Page* 126)

Fig. 5—Polishing sides of 3-quart saucepan

Fig. 6—"Sun-raying" inside of saucepan, using abrasive cloth on special holding fixture



Third Southern

Machinery and Metals Exposition

To Be Held in Atlanta April 5-8

LATEST developments in equipment, supplies and machinery will be shown at the third Southern Machinery and Metals Exposition to be held in Atlanta this spring. According to Alva S. Wilson, exposition president, this year's show, to be held in Atlanta's municipal auditorium from April 5 to 8, will show a greater number of products from more exhibitors to an attendance expected to be greater than last year's 7500.

Intended to be a focal point of contact between manufacturers and Southern industry, the exposition has requests for exhibit space from manufacturers from Miami, Fla., to Portland, Ore. Its purpose is to aid Southern industry in keeping pace with the heavy demands now being placed upon it. Methods of streamlining manufacturing operations, reducing production costs and improving quality will be stressed.

All types of Southern industry, whether it be metalworking, foundry or transportation, serve to benefit from the show, it is stated. Materials handling equipment, from lift trucks to mechanized conveyors, will be exhibited, some of it adaptable to almost any industry. Welding demonstrations, assembly operations, machining methods and process control procedures will also be seen by those attending.

Of particular interest to the metalworking industries will be various kinds of equipment, machinery and tools in actual operation. Ferrous and nonferrous tubing, bars, sheet, casting and forgings reportedly will be exhibited, as will be power and transmission equipment, gages, precision instruments, cutting machines, heat treating furnaces and foundry equipment. Motion pictures are to be shown by many of the companies that are participating, advance reports indicate.

Problems pertinent to Southern manufacturing will be discussed at the Industrial Conference on Machinery and Metals to be held concurrently. Recognized authorities on machining, fabricating and industrial operations will talk. Tours of plants in the Atlanta area also are to be arranged during the exposition.

A list of the companies exhibiting at the third Southern Machinery and Metals Exposition follows:

American Machinery Supply Co...Atlanta, Ga.
Atlantic Steel Co. .....Atlanta, Ga.
Cummins Machinery Co. .....Atlanta, Ga.
Despatch Oven Co. .....Minneapolis, Minn.
Eclipse Fuel Engineering Co. ....Rockford, Ill.
Eutectic Welding Alloys Corp. .New York, N.Y.
The Fairbanks Co. .....New York, N.Y.
Fulton Supply Co. .....Atlanta, Ga.
Georgia Tech .....Atlanta, Ga.
Hyster Co. .....Portland, Ore.
R. S. Kerr Co. .....Atlanta, Ga.
Industrial Service Co. .....Decatur, Ga.
Knox Metal Products, Inc. .....Thomson, Ga.
Master Mfg. Co. .....Hutchinson, Kan.
Marchant Calculating Machine Co.Atlanta, Ga.
Moffatt Bearings Co. .....Philadelphia, Pa.
Noland Co. .....Atlanta, Ga.
Oakite Products Inc. .....New York, N.Y.
Pan-American Metal Products Co. Inc. .....Miami, Fla.
The Partlow Corp. .....New Hartford, N.Y.
Porter-Cable Machine Co. .....Syracuse, N.Y.
Pye-Barker Supply Co. .....Atlanta, Ga.
N. Ransohoff Inc. .....Cincinnati, O.
Rapids-Handling Equipment Co. of Atlanta Inc. .....Atlanta, Ga.
The Rapids-Standard Company, Inc. .....Grand Rapids, Mich.
A. Schrader's Son. .....Brooklyn, N.Y.
South Atlantic Corps of Engineers. Atlanta, Ga.
Southern Machinery & Metals Magazine .....Atlanta, Ga.
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Southern States Equipment Corp. Hampton, Ga.
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QUALITY CONTROL

Offered to Inspectors in Parts Buying Industries

BECAUSE modern statistical methods for controlling quality of manufactured parts and inspecting purchased parts hold far reaching benefits for component buying industries, Hunter Pressed Steel Co., Lansdale, Pa., will inaugurate a weekly series of free, 2-day training courses for inspection personnel enrolled by their management on April 6, 1948.

Representative topics to be covered are: Use of frequency distribution curve and correlation chart in inspection for analysis of production troubles, production control charts, outgoing sampling techniques, quality reports, types of defects, causes and detection, sampling, 100 per cent testing, load-testing of springs, pressureless measurement of flexible parts, gaging, supplier reports, lot-to-lot variation, nonnormal distribution, spring specifications and their interpretation, electronic instrumentation, standard forms and reporting techniques, demonstrations of all types of commercial loading for flexible parts and use of standard frequency distribution curve.

Although the course has been planned specifically for inspectors, purchasing agents and product designers who want to take it as a means of keeping up to date in a function influencing their work are welcome. Special sessions for purchasing agents and product designers will be arranged if sufficient interest is evidenced.

Course will take two full days (Tuesday and Wednesday of each week) including seven lectures by specialists in the field, one forum-type discussion, a complete plant tour to demonstrate the company's methods and a full afternoon of actual testing and calculating practice in using principles learned.

According to President K. D. Montgomery, "The program is our contribution toward widening industrial interest in the statistical methods and their application." Springs will be used as the sample product throughout the course, but methods and interpretations taught will have application throughout the manufacturing industry.

In charge of the course is Philip C. Clarke one of the most active proponents of industrial application of statistical methods and pioneer in the field. Other instructors in the training program and graduates of Temple University's one year course on the subject are: O. G. Meyers, chief engineer; C. H. Sacks, cost controller; F. C. Schultze, chief inspector; C. J. McClintock, assistant chief inspector; and F. A. Votta, engineer apparatus division.

An interesting feature of the course will be actual work with several new types of testing machines and instruments recently developed for ex-

(*Please turn to Page* 130)

MACHINE TOOL INDUSTRY

Prepares for Competition

By DANIEL R. WEEDON
Assistant Manager and Secretary
Blanchard Machine Co.
And
Chairman, Sales and Service Committee
National Machine Tool Builders' Association

EYES of factory management may be focused on the cost-reducing ability of new machines, but the eyes of the financial men will be turned more toward the increased cost of these machines over the prewar models and the necessity, because of an antiquated depreciation policy on the part of the United States Treasury Department, of finding new money for investment before costs can be cut and production raised.

Thus as we approach a competitive period in industry, we also enter the period of greatest opportunity for the machine tool salesmen.

With this in mind, National Machine Tool Builders' Association, American Machine Tool Distributors' Association and Cornell University, Ithaca, N. Y., announce the first special summer refresher course in sales engineering, designed expressly for the machine tool industry, to be held at the Sibley College of Engineering at Cornell University, July 12-23.

The class will be limited to 50 men, nominated by members of the two trade associations.

The faculty will be under the direction of Prof. Harry J. Loberg of the department of industrial and engineering administration, Sibley School of Mechanical Engineering at Cornell. It will include members of the Cornell faculty; sales executives of machine tool builders and distributors; and customers with long experience in buying machine tools.

Each course will consist of lectures, discussions, demonstrations and written assignments, with classes daily from 9 a.m. until 3:30 p. m., five days each week.

This is believed to be the first course in any American university especially designed to provide adequate instruction in the selling of capital goods.

The machine tool industry has had wide variations in its annual sales. The swing has actually been from $22,000,000 in 1932 to $1,320,000,000 in 1942.

In 1947 it did a business of more than $300,000,000 and the industry expects to repeat this year.

Industry today has problems from a competitive standpoint that make it essential to increase production per manhour. This means a major investment in new machine tools.

Many users of machine tools expect a machine to pay for itself in two or three years. Yet the government insists upon an average 20.75-year period of depreciation for these machine tools.

The course at Cornell will seek to arm machine tool salesmen with the basic arguments for the quick adoption of the cost-reducing possibilities of the new machine tools.

The curriculum will be based on the fundamentals of machine tool selling and will cover products, methods and engineering types of analysis involved in the selection of suitable equipment and the sales procedure used in giving the customer full information on the use and value of such equipment.

Subject matter will range from the fundamentals of machine tool selling to market research and product survey, tooling up a job, work simplification man-machine chart, machine layout, material handling and engineering economy.

The committee in charge for the National Machine Tool Builders' Association is its Sales and Service Committee which includes: Reed M. Andress, second vice president in charge of sales, Barnes Drill Co., Rockford, Ill.; James C. Herbert, sales manager, Jones & Lamson Machine Co., Springfield, Vt.,; J. Herbert Myers, vice president, machine tool sales, Lodge & Shipley Co., Cincinnati; B. C. Saunders, secretary, Gallmeyer & Livingston Co., Grand Rapids, Mich.; Herbert L. Tigges, executive vice president, Baker Brothers Inc., Toledo, O.; and Daniel R. Weedon, chairman.

Committee for American Machine Tool Distributors Association is its sales and service committee of which R. L. Giebel, New York, is chairman. On this committee are: Arthur B. Kettle, vice president, Austin-Hastings Co. Inc., Cambridge, Mass.; J. F. Owens, partner, J. F. Owens Machinery Co., Syracuse, N. Y.; Edward W. Voss, president, Voss Machinery Co., Pittsburgh,; George F. Turner, Strong, Carlisle & Hammond Co., Detroit; Frank L. Armstrong, vice president, Marshall & Huschart Machinery Co., Chicago; E. J. Seifreat, president Seifreat-Elstad Machinery Co., Dayton, O.; and H. E. Oatis, partner, Oatis-Booth Machinery Co., Toledo, O.

Industry has seen the remarkable developments which have been made by machine tool builders, but industry still wants to be told by the sales engineer the specific uses of specific machines for specific jobs.

Today the task of the sales engineer is to bring this specific information to the production and financial men of the nation and the world.

Liquid Nitrogen "Fitting" Goes on Mass Production

Though it is generally easier to expand the outside member of an assembly than to shrink inside part, size or hardness or possibility of distortion of outside part may make shrinking advisable. Fits such as valve seat inserts, cylinder liners and bushings are almost impossible to make by expanding outer member because they are usually too large or complex, have finished external surfaces, or have been heat treated. For this work Linde Air Products Co., New York, is now supplying a high purity liquid nitrogen which can reduce temperature of a piece of metal to minus 320° F.

For small lot operation, parts may be dipped in a stainless steel bucket containing a well-insulated internal receptacle for holding nitrogen. Wooden cover is vented to prevent pressure buildup in vessel. For mass production work, the company developed a machine in which parts come into direct contact with liquid nitrogen. Parts are fed automatically or manually into top of machine and ejected after cooling.

Automatic Carbon Arc Welding Simplifies Production of Rotors

By R. B. Keith, Mgr.
American Electrical Products Co.
Mansfield, Ohio

MANUFACTURING our small electric motors requires welding the ends of the copper bars in the rotor lamination assemblies after a previous mechanical upset of the bars during sub-assembly. The weld is required to produce a solid integral unit electrically, one that will eliminate the possibility of the laminations working loose under operating conditions. This process of welding or fusing copper or aluminum assemblies is typical of present day methods to obtain the highest degree of product quality and ruggedness.

Developing a semi-automatic welding procedure has not only reduced our costs considerably but has enabled the operator to obtain highly uniform results on a mass production basis. Our procedure has also simplified the operation problem into one of merely loading and unloading the rotor assembly to and from a fixture.

An indexing type of rotary table fixture (Fig. 2) incorporates three stations, one for loading, one for the work position in which the piece is rotated under the welding electrode, and one for unloading after welding. Hand operated positioning pins locate the table in alignment with the welding carbon electrode as each station comes into the welding position.

Carbon arc welding is performed with a Lincoln TA-3 "Electronic Tornado" automatic welder (Fig. 1), melting the upset ends of the copper bars and fusing the ends of the bars into a continuous ring. In the operating or welding station, the work-holding plug is set to rotate at a predetermined speed, allowing the periphery of the rotor face to travel under the carbon arc at the correct welding speed. A tilting adjustment on the table permits variation of the bead shape. A 2.32" diameter rotor is fused in a 15-second cycle, using 100 ampere current on the welder.

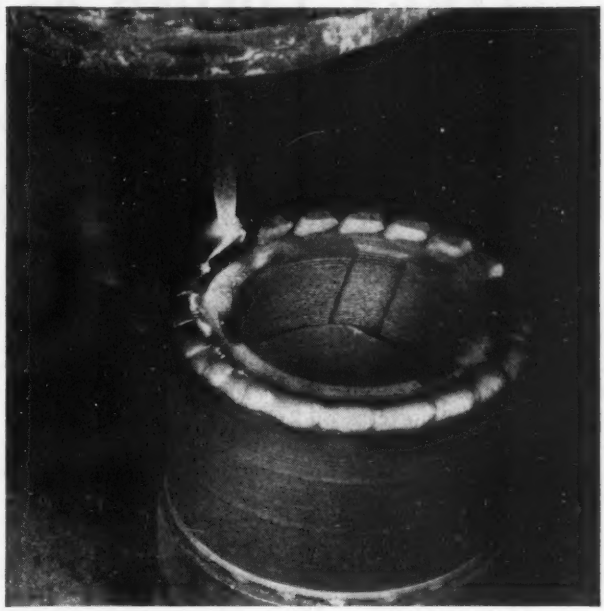

Fig. 1. Arc welding copper bars into a continuous ring. Cycle time—15 seconds.

Under production conditions, the table is fitted with a hood guard (Fig. 3) to shield the operator from the arc. The welding cycle is such that it allows the work to be removed from the furnace, where it is preheated to 700° F., and the work loaded onto the indexing table before rotating the table to the arc station position. The indexing of the table actuates cams that start the welding cycle, eliminating any need for the operator to push a starting button on each cycle. A machining cut is taken after the piece cools to square the face of the weld.

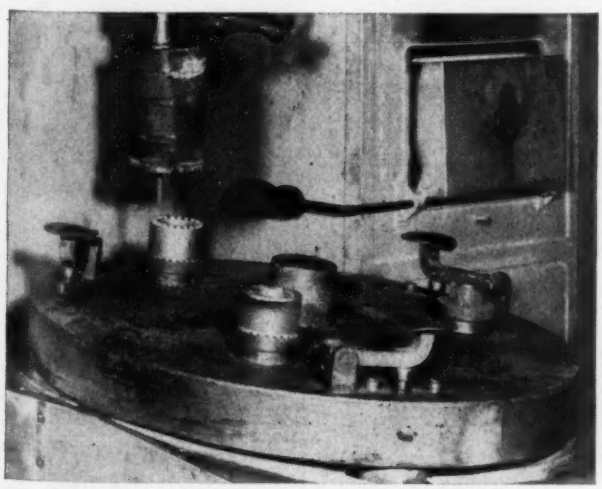

Fig. 2. "Electronic Tornado" Welder mounted on a rotary indexing table-type fixture—hood removed.

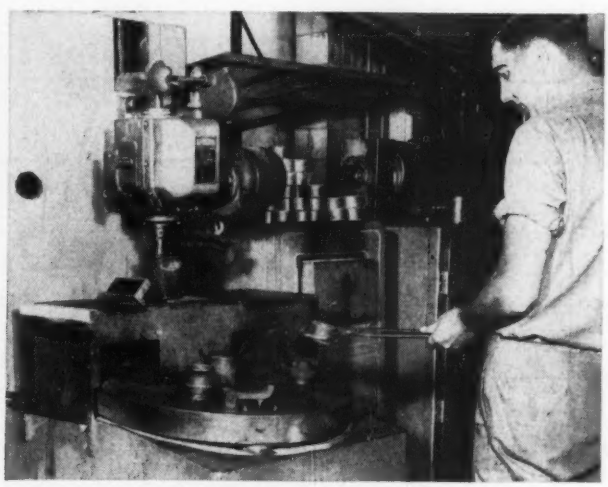

Fig. 3. Loading preheated rotor assembly on indexing table.

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Write for information on the "Electronic Tornado." The Lincoln Electric Company, Dept. 73, Cleveland 1, Ohio.

Advertisement

Economic Considerations for STACK LINING REPAIRS

By W. R. TROGNITZ
Ass't. Supt. Blast Furnaces
Carnegie-Illinois Steel Corp.
Youngstown, O.

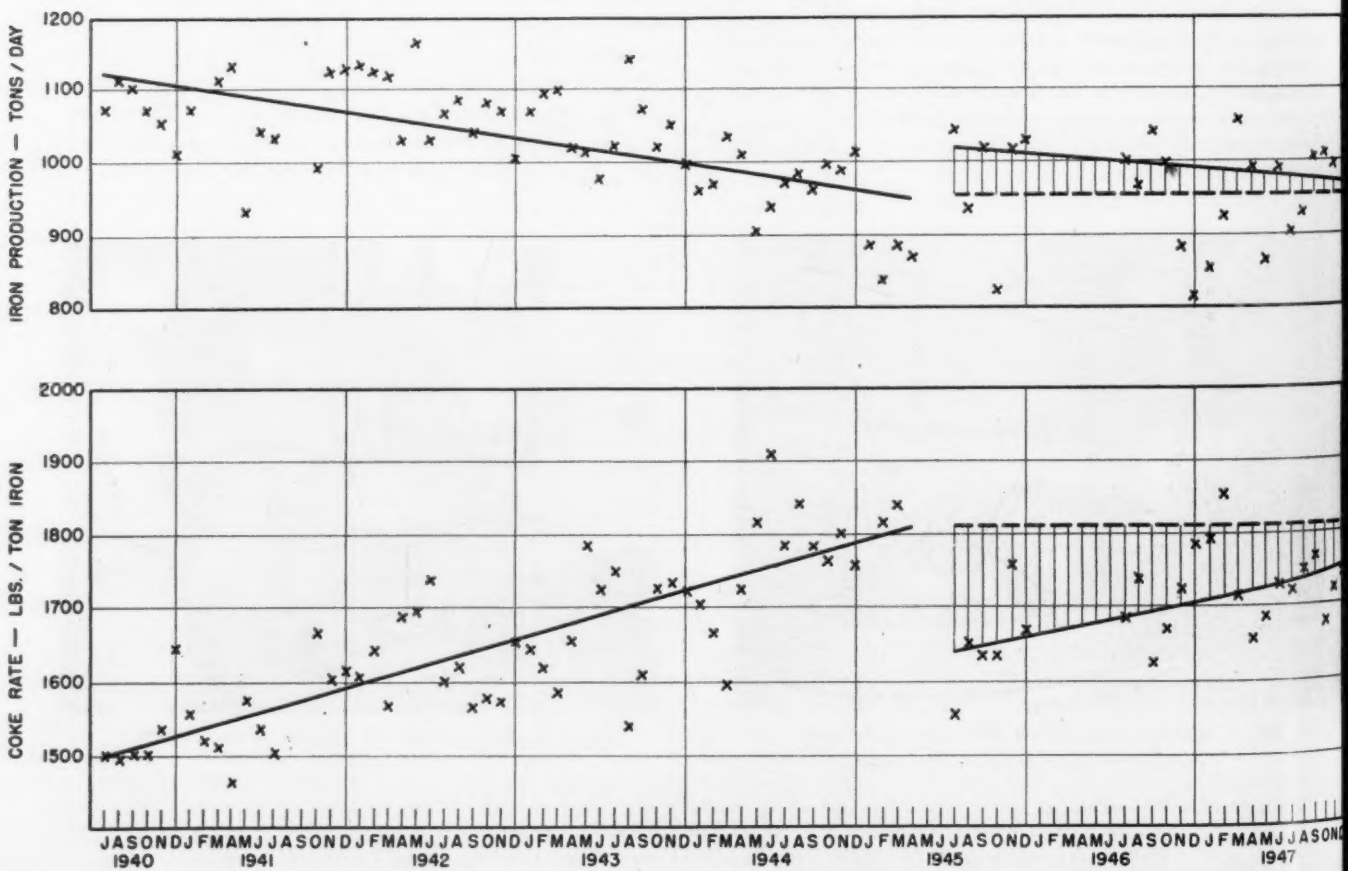
Saving in coke over a 5-month operating period effected by the replacement of 24 feet of brickwork above the mantle, more than paid overall repair cost. Rehabilitation of inwall affords detailed inspection of refractories and increase in production of iron. Details of repair program are described

APPROXIMATELY 25 years ago the production of 1,000,000 tons of iron on a blast furnace lining was considered good performance. Today, most medium and large-sized furnaces produce in excess of 2,000,000 tons during campaigns lasting commonly between 2000 and 2500 operating days.

The most common reasons for terminating a furnace campaign, occurring either singly or in combination, are: Extreme deterioration of furnace performance, hearth breakouts, stack lining failures, excessive copper losses, and others. As soon as any one of these signs begins to manifest itself it becomes necessary to decide on the scope of repairs. A decision is easily reached under either of the following conditions: When a furnace has almost approached, or surpassed, its expected lining tonnage, in which case a complete new lining must be provided; or, on rarer occasions when a premature stack lining failure makes a patch or partial relining mandatory. Between these extremes are found numerous furnaces confronting the operator with many and varied lining repair problems. Particularly difficult are cases where there are no outward signs of lining troubles, but furnace performance shows all the reactions normally associated with a worn lining. This study will be confined to a discussion of stack lining repairs made at No. 2 furnace, Ohio Works, Carnegie-Illinois Steel Corp., Youngstown, O., primarily for economic considerations.

The furnace was blown in after a complete relining during July 1940. In August 1941, the hearth wall failed and a new bottom was installed while the bosh and stack lining were supported at the elevation of the tuyere coolers. During this shutdown no repairs were made in the stack. Blown in again in September 1941 the furnace operated continuously until May 1945 when it was blown out for renewal of the stockline wearing plates. At the beginning of its campaign No. 2 furnace consistently averaged its rated capacity of 1100 tons per day with a coke consumption also consistently around 1500 pounds per ton of iron. During the early months of 1945 the production rate had dropped to less than 900 tons daily with a rise in coke consumption to 1800 pounds. In this latter period the furnace was difficult to control, burned many tuyeres, was frequently on high pressure, and material at the tuyeres indicated bad stock distribution. The reason for the last condition had been known

Iron production and coke rate during campaign of A-furnace


IRON PRODUCTION — TONS / DAY
1200
1100
1000
900
800
COKE RATE — LBS. / TON IRON
2000
1900
1800
1700
1600
1500
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1940
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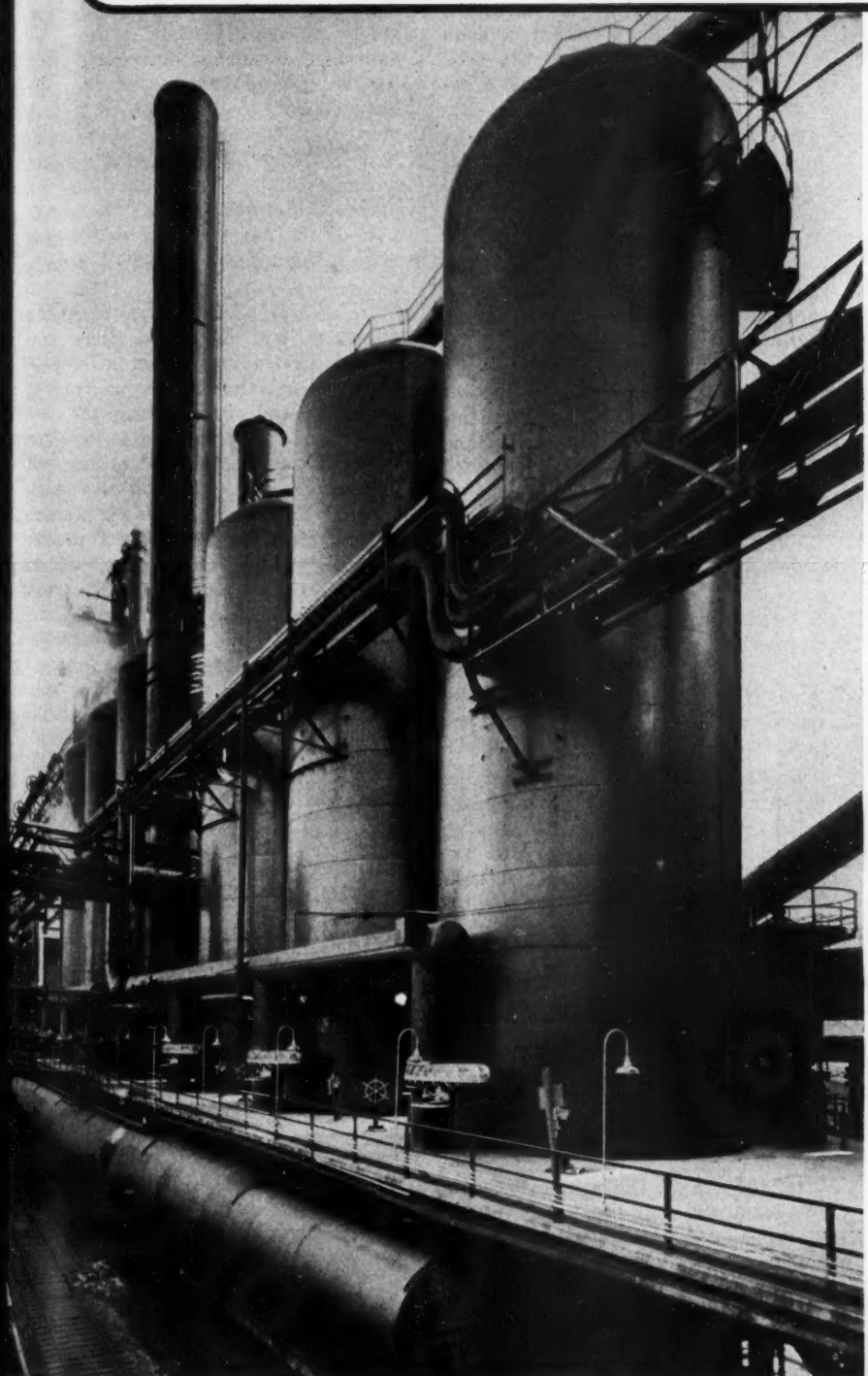

Engineering activities of Arthur G. McKee & Company in recent years included many diversified projects for the Iron and Steel Industry. Among these were 118 hot-blast stoves constructed since 1935.

The largest, most modern stoves constructed by McKee have 28-foot inside diameters and a height of 133 feet, 6 inches. Each stove has a heating surface of 290,295 square feet.

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OPERATING RESULTS COVERING 5-MONTH PERIOD

	Repairs		
	Before	After	Difference
Iron production, n.t.	130,028	147,540	+17,512
Coke consumption, lbs./ton	1,848	1,637	—211
Coke consumption, total tons	120,120	120,738	+618
Tuyeres lost, no.	277	41	—236

for some time, because numerous inspections of the stockline had revealed considerable, and progressing, wear and distortion of the wearing plates, as well as the brick directly below them.

At the time of decision on a stockline renewal, total iron production on the various sections of the furnace stood as follows:

Section	Tons
Hearth	1,338,000
Bosh & Stack	1,770,000

Since there were no apparent signs of weakness in either the hearth, bosh and lower stack, it was felt the stockline repairs would bring about a substantial improvement in furnace performance and assure at least an additional two years of operation. It will be shown later that both expectations materialized.

Detailed inspection of the lining after blowing-out confirmed the stockline condition previously observed. The remainder of the stack lining was almost entirely free of scabs and worn surprisingly uniform from its original thickness of 42 to 48 inches to the thinnest section in which 24 inches of brickwork remained. Upon closer inspection, however, extensive brick disintegration was found in the lower inwall and it was deemed advisable to replace 24 feet of the lining directly above the mantle. This was accomplished by supporting the upper lining by means of knee-braces welded to the shell and cables anchored at the furnace top. Consequently, overall repairs to the furnace consisted of replacing 24 feet of brickwork above the mantle and renewal of the stockline wearing plates with 4 feet of brickwork below and the dome brick above. Total outage of the furnace was 31 days.

Effect of the lining repairs on furnace performance is shown in the accompanying illustration. The top curve represents average daily iron output and the bottom one coke rates. The solid lines in either curve denote the average trend before and after repairs. Concerning the production curve it will be noted that the furnace started its campaign with an average daily output slightly in excess of 1100 tons which gradually dropped to about 950 tons after 1750 operating days. After repairs were made the average daily production resumed at 1020 tons and tapered off to approximately 960 tons. The dotted line has been included on the assumption that the furnace could have operated the same length of time without the repairs and maintained its output through the latter stages of its campaign. Consequently, the shaded area between the solid and dotted lines represents the estimated iron tonnage gained as a result of the lining repairs.

Similarly, in the bottom curves, the coke consumption during the initial months was 1500 pounds per ton of iron and rose to over 1800 pounds. After lining repairs the coke rate resumed at 1640 pounds and gradually climbed towards 1750 pounds near the end of the campaign. Again, relying on the supposition that the furnace could have completed its overall lining life without further deterioration of coke practice, as indicated by the dotted line, then the shaded area comprises the estimated coke savings realized by the lining repairs. While the aforementioned assumptions on the life remaining in the original lining are admittedly conjectural it can be pointed out, however, that the leveling off of production rate and coke consumption is unlikely and the estimates of additional iron produced, as well as coke saved, are therefore figured on the conservative side.

Another method of illustrating the benefits realized from the lining repairs is shown in the accompanying table. The significant feature exhibited in this tabulation is the gain of 17,500 tons of iron production without additional coke requirements. If the lining repairs had not been made the production of 17,500 tons of iron would have required an additional 16,200 tons of coke. This coke saving alone, during the five-month period and at the prevailing price of coke delivered at Youngstown, more than paid for the overall cost of the repairs.

In addition to the monetary benefits resulting from the improvement in furnace practice there are some collateral advantages attributable to the rehabilitation of a furnace lining, as follows:

1. Major repairs to auxiliary facilities can be undertaken concurrently which might otherwise and separately require extensive furnace outage during a long campaign.

2. Opportunity for a detailed inspection of furnace lining permits establishing, with reasonable accuracy, an estimate of the remaining life of the lining. This information is of considerable value at large plants.

3. Increased iron production from a fixed coke supply at plants with inadequate coking capacity, or those dependent on purchased coke.

From the foregoing account it can be concluded that, under certain conditions, it is economically sound to repair blast furnace linings after an initial operating period of 1600 days, or more. The restrictive conditions can perhaps best be summarized in the question: Will the furnace run safely for another 2 to 3 years, or expressed somewhat differently: Will the unrepaired sections of the furnace support another run of 2 to 3 years? If the answer to these questions is in the affirmative it appears advisable to proceed with lining repairs. In most instances the condition of the hearth likely will be the critical factor in reaching a definite decision.

In all probability the foregoing questions will be asked more frequently in the future than in the past because of the numerous carbon hearth installations during the last few years. At present it is expected that carbon hearths will outlast not only ceramic hearths but also stack linings. In the event this supposition is confirmed it is fairly safe to predict that the life of stack linings will be geared to the ultimate life of carbon hearths by means of lining repairs. The alternative to this prediction lies in the possible development of ceramic refractories with qualities substantially superior to those now available.

This paper was presented at the Annual Winter Meeting of the Eastern States Blast Furnace and Coke Oven Association, William Penn Hotel, Pittsburgh, Feb. 6.

Large Turbine Orders Result of Power Needs

More than 9,500,000 kilowatts of power will be added to the nation's capacity within the next 4 years with the installation of steam turbine-generators now on order with General Electric Co., Schenectady, N. Y., according to J. W. Belanger manager of the turbine divisions. It will take 5 years before production equals demand, and then continuing growth and obsolescence will continue to require production at a high rate.

Higher temperatures and pressures, plus other engineering advances, have raised efficiencies to the point where it is now possible to generate a kilowatt of electricity with less than a pound of coal as compared to three times this amount needed on old installations. Average size of turbines has risen to about 50,000 kilowatts which is about 50 per cent greater than a decade ago.

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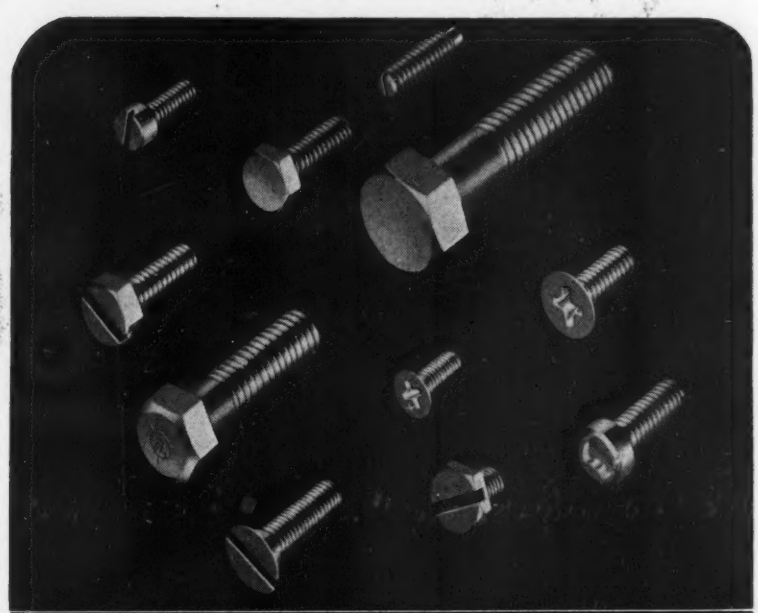

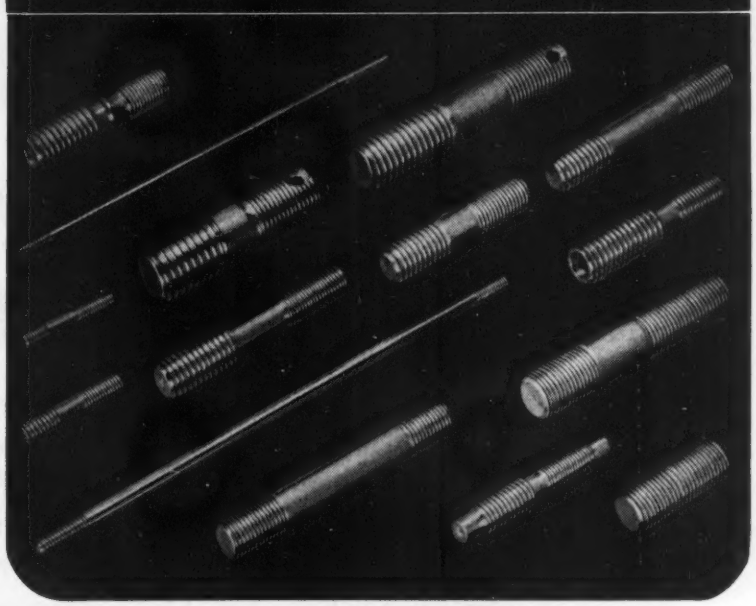

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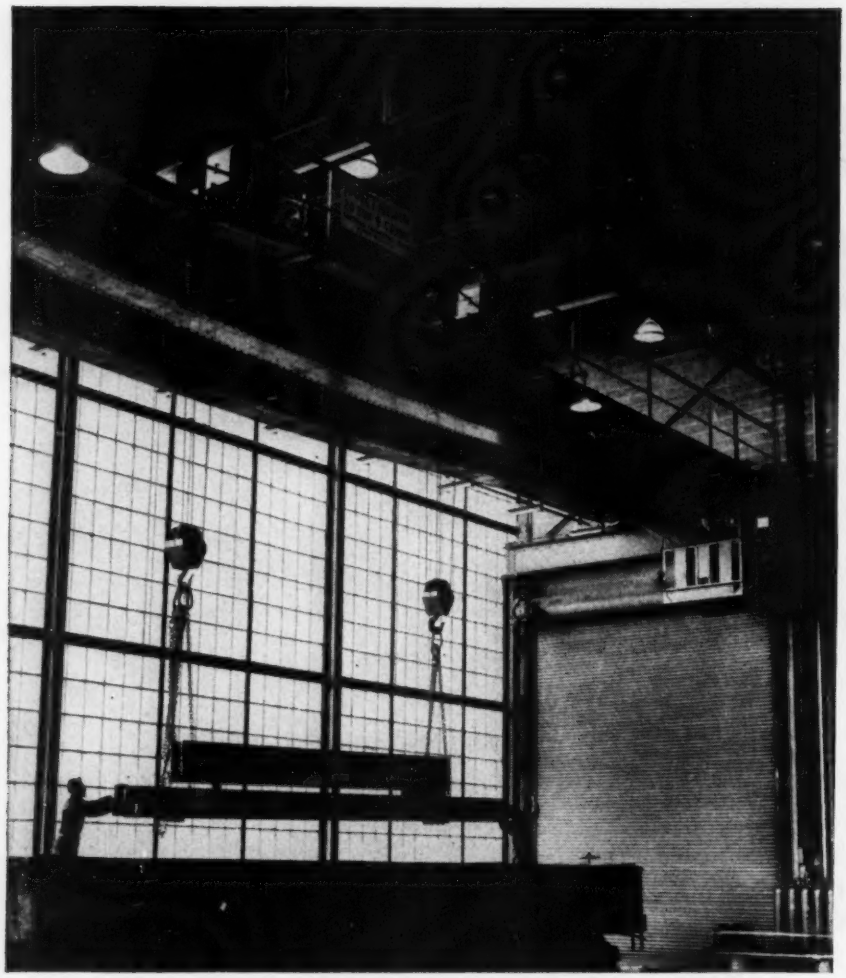

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OVERHEAD ★ ELECTRIC CRANES ★ AND HOISTS ★

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Modern Die Casting

(*Continued from Page* 92)

slides are used and there is a secondary parting, two trim dies are often needed.

Flash formed by a core is sometimes removed by a punch or other tool. In other cases a rotary tool, such as a drill, spot facer or counter sinking tool is employed. Often, some flash is ground off on an abrasive belt or wheel. Flash at intersecting cores may require a reamer, broach or rotary file. Hand tools, especially scrapers and files, are often used to remove some flash but usually as much flash removal is done by shearing dies or other power operated tools as is possible.

Trim dies, punches and occasionally broaches are about the only special flash removal tools commonly needed, and they are usually made from ordinary carbons tool steels. Alloy or high speed steel can be used, if the service is severe or if the casting alloy has high silicon content. The same is true of other cutting tools but those having carbide tips often prove most economical.

Flash removal is commonly done on a single casting at a time but in some cases, two or more small castings from multiple-cavity or combination dies can be trimmed at the same time. In such cases, the trim die has an opening for each casting and the openings are spaced exactly as in the casting die. This works well only if the castings are held an unvarying distance apart, or if they are so shaped that they tend to center themselves in the trimming die openings.

Trend in Die Casting—One of the most significant trends in die casting has been the growth of the industry in recent years. Designers have found new applications for the process, both in the fabrication of "appearance" parts and those of functional mechanisms.

War demands called for a very large volume of high quality aluminum die castings so that cold chamber injection system machines were brought into widespread use. Present demands for parts are approximately 60 per cent zinc and 40 per cent aluminum. Partly because zinc is readily plated (any plating is difficult on aluminum but considerable is now done on a commercial scale) zinc is used extensively for automotive and like commercial applications. Zinc is also much more ductile and is easier to cast in the complex forms applied in automotive applications.

Magnesium is still new to designers and engineers and it undoubtedly will be some time before war-time volume is again reached. H-P-M has a die

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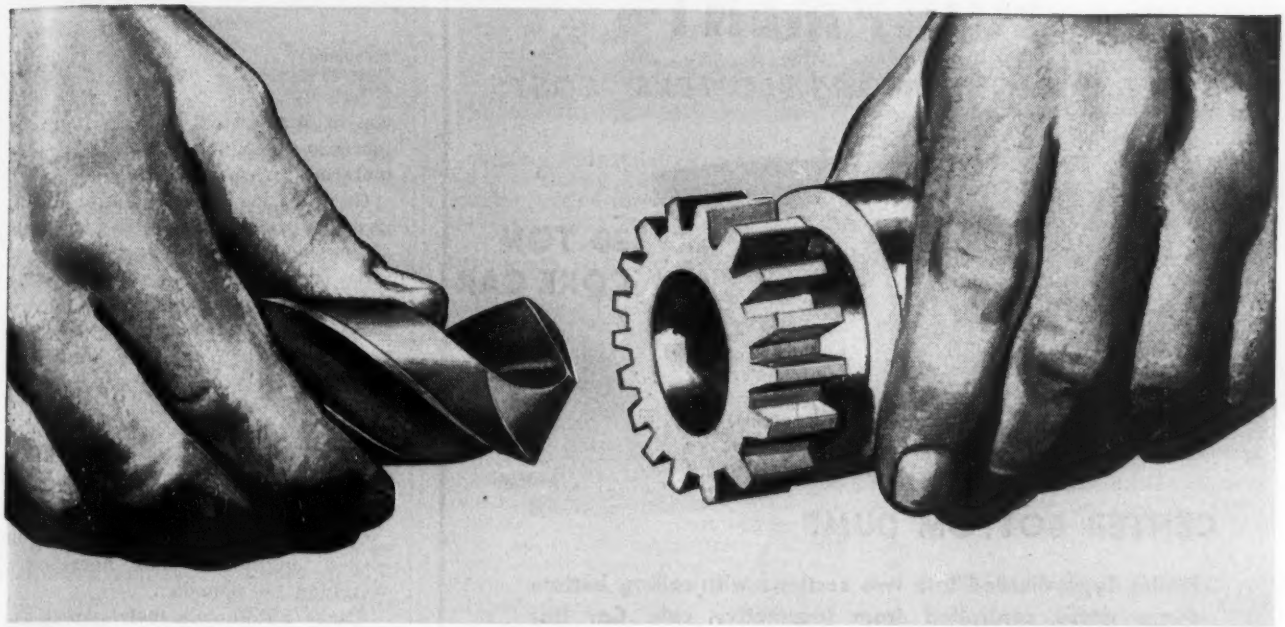

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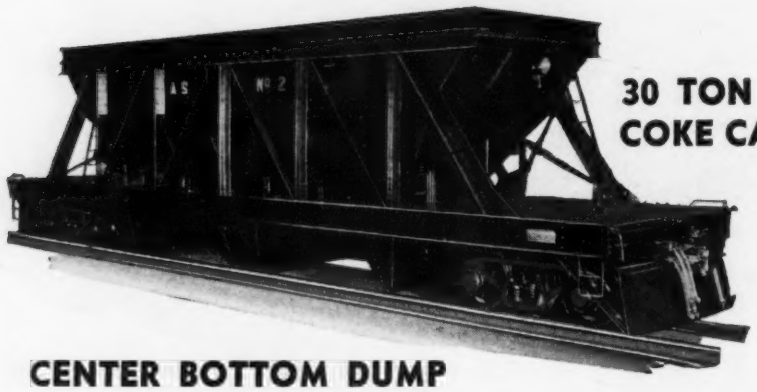

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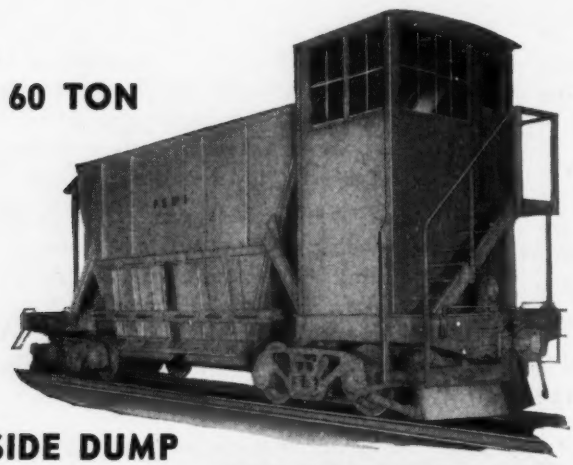
Trailer Type divided into two sections with rolling bottom dump gates controlled from locomotive cab. Car has self-aligning bearings, air brakes and standard safety equipment.

60 TON



SIDE DUMP ORE TRANSFER CAR

Two compartment hopper with separate discharge gates, independently operated from front and rear vision cab. Car is equipped with air brakes, self-aligning bearings and standard safety equipment.

ATLAS ENGINEERING SERVICE IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

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casting machine developed to give the high injection speed of 600 feet per minute considered necessary for present magnesium alloys.

Magnesium sells in the same price range per pound as aluminum and zinc. It is actually the cheapest, per cubic inch, of the three. Obviously, the use of magnesium die castings will increase as engineers learn to use the material to advantage.

	Cents/lb.	Lb./cu. in.	Cents/cu. in.
Aluminum	13.00	.10	1.50
Magnesium	20.50	.066	1.35
Zinc	13.50	.24	3.24

One of the largest aluminum die castings made is the Jack and Heintz air cooled engine cylinder and crank case unit. The air cooling fins are thin, long and spaced fairly closely together. The casting weighs 15 pounds as cast and 13 pounds finished. Dies weigh 14 tons and took 50 men 1 year to build.

Die cast air cooled engine blocks for aircraft and automotive use are feasible. The McCulloch Motors Corp. of Los Angeles announced a three-cylinder, 2-cycle opposed piston air cooled engine of 125 horsepower, weighing 150 pounds.

Large automobile body panels and doors have also been considered in both aluminum and magnesium die castings. Electric motor manufacturers are turning to die casting for housings, end bells and the like, as well as for help in improving actual working parts. In rotors, copper rotor bars, separate conductor rings and stamped steel fan blades have been eliminated by die casting all of these elements integrally in high purity aluminum.

The building industry is using more zinc die cast hardware to meet shortages and cut costs. Meters, gas and electric, and even electrical conduits are now made more economically as aluminum die castings.

Application of die casting has increased over recent years at a significant rate, and more expansion in the field may be expected in the future. Reasons for the growth include better production equipment, an increased use of die cast parts by designers and advancing costs of machining and conventional foundry work. Larger die castings, particularly in aluminum and magnesium, can be expected. An expansion in the use of brass is also to be anticipated.

—o—

Maintenance and repair facilities with pickup and delivery service are available to users of fork lift trucks and industrial tractors in the New York area. Selection of this location by Towmotor Corp., Cleveland, is based on the large number of units used in the vicinity.

Preparing Surfaces

(*Continued from Page 95*)

¼-inch may sometimes buckle under the impact of a vigorous blasting with heavy abrasives. If however these are turned over and blasted on their reverse side, they will flatten out sufficiently so that the warping will not be objectionable.

From those surfaces which are hard and resistant, it is recommended that the nozzle be held about 8 to 12 inches away from the work; such a concentrated blast will project the abrasive onto the surface with the maximum force. In the case of softer materials, the nozzle is held farther away from the surface and the air pressure used is lower. The blasting should be carried out in a systematic manner, the nozzle being moved back and forth in a straight line, permitting each pass to overlap the one preceding it. In this way a uniform job will be obtained.

Precautions—As a general rule, no more of the surface is blasted than can be metallized in a single day. This precaution is taken, because an oxide film tends to form very quickly on a freshly blasted surface; this occurs particularly in humid and corrosive atmospheres. For this reason, the coating should be applied as soon as possible after the blasting and certainly within a few hours of it.

When heavy coatings are applied over such comparatively large areas as are found on the surfaces of turbine runners and pump impellers, it is necessary that additional anchorage be provided for the sprayed coating. For example, flat head screws can be inserted into the face of the area, in such a way and spaced sufficiently close so that the sprayed metal will lock itself around these screw heads. The screws used should be composed preferably of the same type of metal used for the coating and these also are thoroughly worked over during the blasting operation.

After the surface is blasted, it must be kept clean until the spraying operation is completed. These blasted surfaces should therefore not be handled with the bare hands, as this may be the means of imparting grease to them. Again, the hoses should not be allowed to drag over the surface, because of the dirt which is usually attached to them. If by chance the blasted surface has become dirty or oily, it should be wiped off and then the spots lightly blasted using a fine abrasive with a low air pressure.

Rough Threading—In those cases where the surface is to be prepared by rough threading, then once the work has been set up in the lathe,

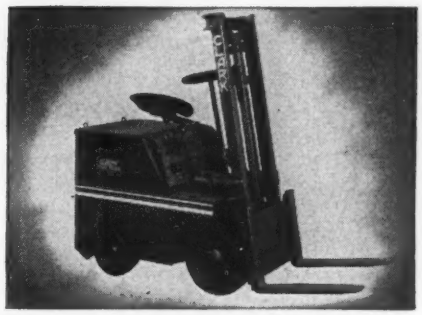
MATERIAL HANDLING *News*

You'll appreciate why Clark Electric Battery-Powered Fork Trucks enjoy an extraordinary leadership when you consider these basic advantages:

1. **Clark manufactures its own major units**
2. **Clark enjoys the benefit of assembly line production**
3. **Clark provides maximum interchangeability of parts**

Among industrial executives who *know operating costs* of electric fork trucks—taking into consideration initial investment, maintenance cost and operating cost—Clark electric fork trucks are preferred by a generous margin.

These men's opinions may be summarized in the terse comment of one of them—"Clarks cost less!"



Here is electric battery power in fast, maneuverable form — instantly applicable to countless routine assignments.

1. VOLUME MANUFACTURE EFFECTS BIG SAVINGS

It is a fact scarcely in need of emphasis to production men that the volume manufacture of Clark machines achieves many important economies. Practically all the major units in Clark machines are produced in Clark's own plants, and on a mass scale—axles, transmissions, wheels, frames and smaller units. All these units must meet the exacting standards established for Clark Products. All possess that rugged excellence that has built the Clark reputation for fine engineering.

Economical assembly saves dollars for customers. Here electrical control gets final inspection.

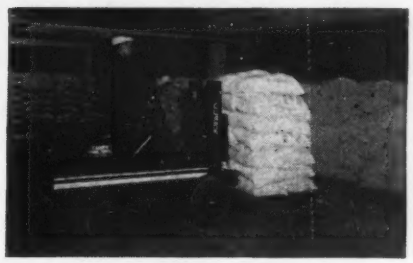
2. ASSEMBLY-LINE ECONOMIES

A further benefit passed along to users of Clark machines derives from Clark's assembly-line production. Inasmuch as Clark builds both types of fork truck—electric battery-powered and gas-powered—Clark's output is by far the largest in the industry.

3. INTERCHANGEABLE PARTS

A third potent advantage springs from the maximum interchangeability of parts perfected by Clark. Insofar as is possible, parts used in electric trucks are identical with similar parts of gas powered trucks—a source of important savings to Clark users.

The fact that "Clark builds both" is worthy of repetition, and you realize why. Clark's recommendations are unbiased. You get wholly objective counsel concerning your operations and the types of machines that will serve you most efficiently and economically. Here, indeed, is a good recommendation!—CONSULT CLARK.



How to cut handling costs "to the bone"—in one easy picture-lesson.

CLARK GAS AND ELECTRIC POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

CLARK EQUIPMENT COMPANY, TRUCTRACTOR DIVISION, BATTLE CREEK 26, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

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SLAB HEATER

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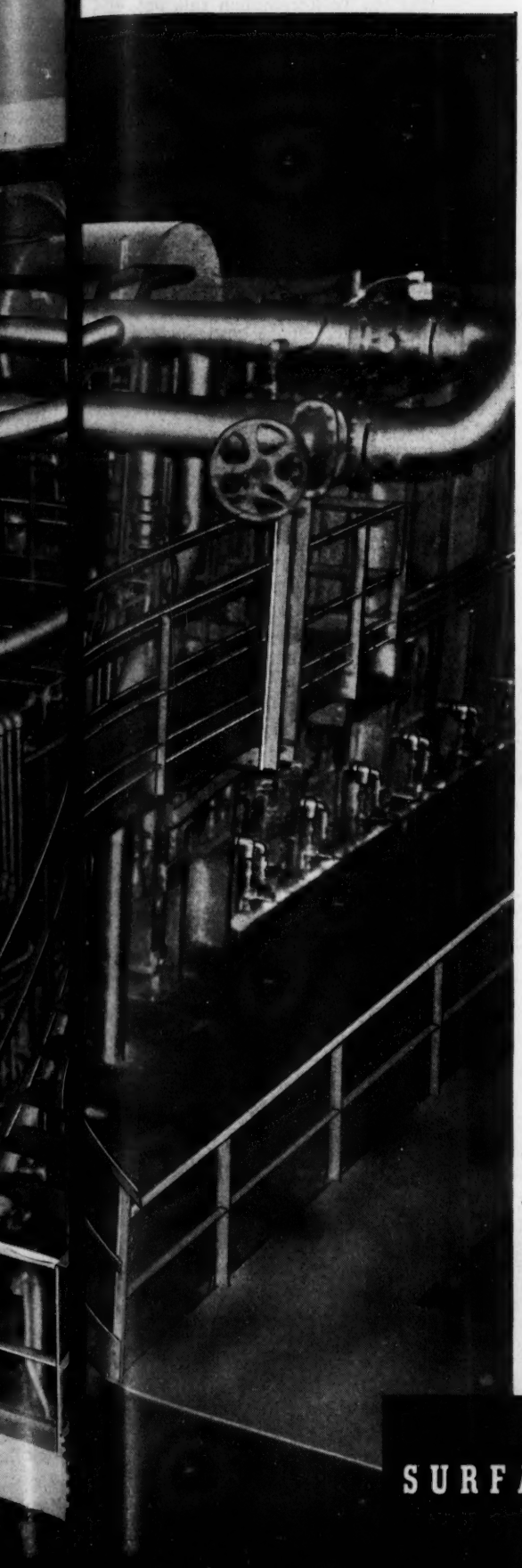

IN the initial processing of coiled strip steel, used for tin plating, huge steel slabs, 150 in. x 42 in. x 5½ in., and weighing approximately 9800 pounds each, emerge from this Surface Combustion Slab Heating Furnace, the newest and largest in the world, installed in the plant of Weirton Steel Company, Weirton, W. Va.

This furnace is 94' 9" in length and the width is 28' 0". It is of the recuperative type and has a "Tripled-Fired" burner arrangement of Surface Combustion design.

Here is another outstanding example of 'Surface' engineering, manufacturing and installation of modern heating and heat treating equipment in the steel producing industry. Other equipment includes One-Way Fired Soaking Pits—Billet Reheating Furnaces—Continuous Heat Treating Furnaces for Plate—Pit Type Convection Furnace for Annealing Rod Wire and Strip in coils—Continuous Strip Annealers and Normalizers—High Alloy Rod and Bar, Atmosphere Annealing Furnaces of Car-Bottom, Lift-Cover Type—Bright Annealing and Normalizing Furnaces for Tubing—Stress Relief Furnaces—Wire Patenting Furnaces—Annealing Covers, and the foremost equipment in Prepared Gas Atmosphere Generators for practically every heat treating operation.

We will welcome the opportunity of working with you on your heating and heat treating problems.

'Surface'

SURFACE COMBUSTION CORPORATION

TOLEDO 1 OHIO

there is no necessity for removing it, until it has finally been sprayed and even finished, unless the final finish calls for wet grinding. The tool used for producing a rough thread is ground in such a way as to produce a tearing effect rather than to make a clean cut. The main idea is to drag a thread in the surface instead of cutting it,. To accomplish this objective the tool must be set in a certain relation to the work. Its point is set below the axis for the work so that a tearing action will occur.

It is recommended that different tool settings be experimented with until the correct type of thread is produced. During this rough threading operation, the work must rotate slowly. On mild steels, a surface speed of as much as 40 feet per minute will give good results; however, with alloy steels, cast iron and bronze the surface speed will have to be reduced. There is no fixed rule to determine the speed since the grinding action of the tool and the way it is set will have a substantial effect on the speed of threading. Best results are obtained if the work is rotated slowly.

Number of threads per inch will vary from 16 to 24 depending on the diameter of the piece and the nature of the material. For a 1-inch shaft, a figure of 24 threads per inch will give very good results, but for a bronze or cast iron member of the same diameter, a slightly coarser thread should be used. As the diameter of the piece increases, the number of threads per inch should decrease; but it is recommended that less than 16 threads per inch never be used, irrespective of the diameter of the piece or of the material being threaded.

Thread should be formed in one traverse of the threading tool. With the work in motion, the tool should be run in to the full depth of the thread, or a few thousandths more, and the threading operation started. If the thread is being correctly made, innumerable fissures which resemble barbs will appear in the sides of the threads. If the tool is set slightly more than the correct depth, the top of the thread will be torn and shredded.

After the threading operation is completed, any burrs attached to the top of the threads should be removed, otherwise the coating will be rough and humpy. To do this a square end bit is used, and is set in so that it just misses the top of the thread, and knocks off the burrs as the work is rotated.

Bond strength of a properly threaded surface is amazingly high, and can be relied upon to stand up under

● Horsburgh & Scott Worm Gear Speed Reducers are extremely simple in design, compact, efficient and strong . . . assuring quiet operation, low maintenance and long life. They are available in 8 types . . . reductions from 3⅝ to 1 up to 10,000 to 1.

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the most severe and adverse conditions. The threads localize any transverse stresses set up in the coating, as each section between the thread carries its own load and cannot shift axially. In addition, the many fissures opened up in the sides of the threads, during the threading operation, present such a perfect bonding surface to the sprayed metal, that it is quite impossible for the coating to shift circumferentially.

Thus there are four operations involved in rough threading. First the diameter of the shaft is reduced so that coating of sufficient thickness can be applied. Next, square up or undercut the ends of the reduced section. Then the piece is rough threaded. Finally the burrs are removed from the top of the threads.

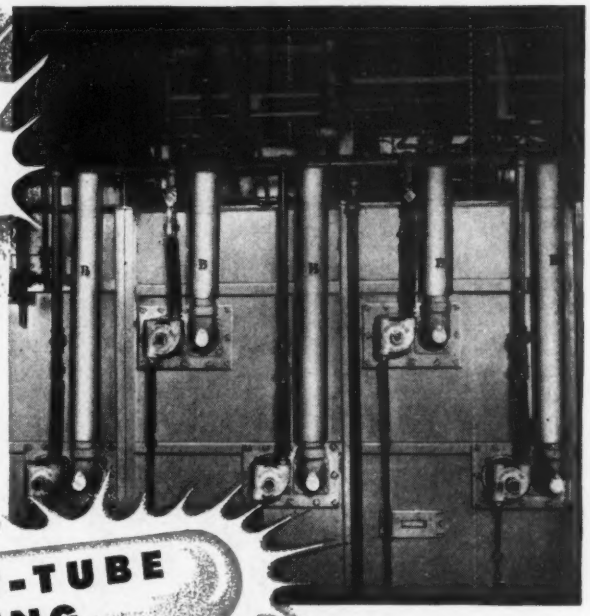
At times, it will be found that the part being worked upon has a deep score or exceptional wear at some place. In these cases, it is quite permissible to step down; however the corners of the steps should be slightly rounded. Again, after a shaft has been reduced to the proper diameter, the shoulders at the end may be slightly dovetailed to give additional anchorage.

Electric Bonding—The third method of surface preparation prior to metallizing so as to effect good adhesion, is the electric bonding method. This is a comparatively new and recent advance and it may supplant both the grit blasting and the rough threading methods, for many jobs. The tool used is very similar to that of an ordinary arc welding torch. A nickel-iron electrode is rubbed across the surface to be sprayed. Small particles of the electrode are fused into the surface and this produces roughened crater-like effect, providing a large number of small irregularities to which the subsequently applied metal coating can adhere. The heat generated by the electric bonding method is dissipated so rapidly into the remainder of the surface, that the temper of the part is not affected.

New Inspection Method Finds Ceramic Defects

Cheaper manufacture and better service are realized in such items as porcelain enameled stoves, sinks and refrigeration liners by locating finish defects with an electrified particle inspection method developed by Magnaflux Corp., Chicago. The nondestructive test eliminates wasteful scrap and expensive replacements which arise when defects are located by chance after original manufacture.

BLAZING THE HEAT TREAT TRAIL



The first radiant-tube continuous furnace was built by Holcroft in 1936, and is still producing efficiently. The furnace at right shows the simplicity of the Holcroft radiant-tube installation.

RADIANT-TUBE HEATING

Applied by Holcroft in 1936 for

LARGER FURNACE CAPACITY *with* GREATER ECONOMY

Introduced by Holcroft in 1936, radiant-tube heating of continuous furnaces solved the problem of constructing larger, more durable furnaces for controlled-atmosphere heat treating. This development made possible the high-production furnaces of today.

As applied by Holcroft, this heating method offers the following advantages:

- *Gas, oil or electric firing* may be used, whichever is most economical.
- *Combination oil-gas burners* are available, with quick changeover provided.
- Holcroft burners are of *closed-head design.* Air and fuel are metered, and are progressively mixed as they pass through the tubes. This assures both maximum combustion efficiency and the uniform heating required for maximum tube life.
- The burner design permits *floating control,* with the same superior performance at all rates of heat input.
- All tubes are readily replaced without cooling the furnace; and electric heating elements are replaced without removing the tubes.

These are but typical of the many advantages provided by Holcroft engineering leadership. Each Holcroft furnace is *designed individually* for its specific application, and *complete metallurgical and engineering service* are provided. Thus Holcroft assures *maximum over-all economy* in production heat treat furnaces for EVERY purpose.

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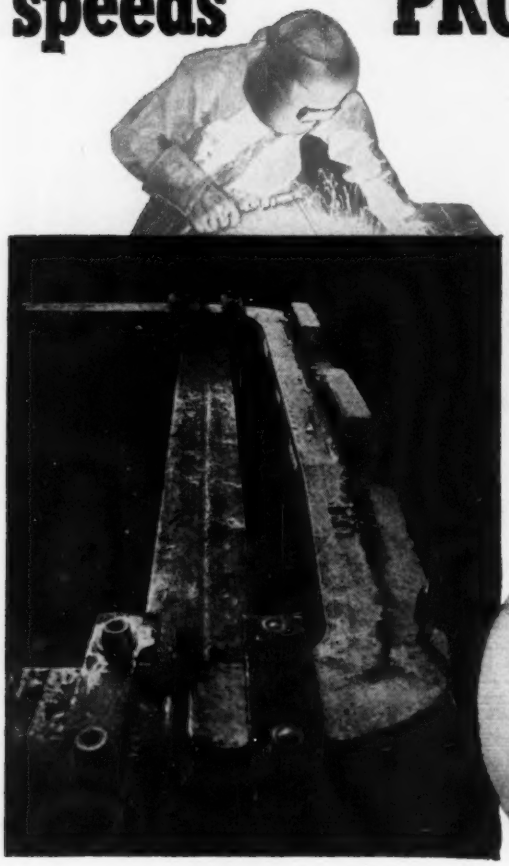
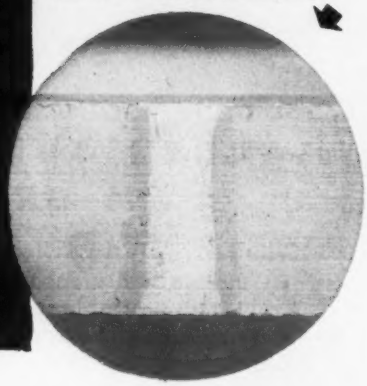
R. E. McARDLE
5724 NAVIGATION BLVD.

BALDWIN LOCOMOTIVE speeds PRODUCTION with FHP





Cross section of straight gap weld made with FHP in Locomotive mud ring.

Using the correct M & T electrode . . . plus a wealth of welding "know-how" is the combination that consistently produces high speed, high quality fabrications at low cost in the Eddystone plant of the Baldwin Locomotive Works.

An excellent example is their production line manufacture of water-space frames . . . or mud rings as they are more frequently termed. These frames, used in locomotive boiler assemblies range from 4′ x 5′ up to 10′ x 22′ in size and are made from bars 4″ to 8″ in width and 3″ to 5″ in thickness. All welding is done in straight-sided gaps with $\frac{5}{16}$″ Murex Type FHP electrodes at approximately 600 amperes . . . an overloading of current which few electrodes will withstand. Results, however, are extremely high speed operation with no sacrifice whatever in welding quality . . . a neat trick but daily routine at Baldwin where welding ingenuity and M & T electrodes combine to provide welding speed, quality and economy.

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M&T ELECTRODES and GAS RODS
M&T WELDING ACCESSORIES

Forming Operations

(*Continued from Page* 104)

into plating. Copper plating is accomplished electrolytically in a manner not too uncommon from other normal plating processes.

Plating cycle requires considerable time, and rinse is made on the backware trip. Thereafter, plated bottoms are 100 per cent inspected as to quality of plating and thickness. Gage indicator must show 0.027-inch plating case and finish of 0.025-inch after polish.

Polishing—In the polishing technique, copper plating is trimmed in a Coulter cartridge case lathe adapted for this purpose to form a perfect transition line between copper bottom and the stainless steel vessel. Parts then move to the bottom polish belt conveyor and into rough polish of the bottom copper. This is done on a 10 horsepower Rome R. O. D. spindle lathe. The wheel is set to contour and radius, cemented with No. 90 grit aluminum oxide polishing grains. Work is held by vacuum chuck on a semiautomatic machine spindle which revolves the pan, having a lever which throws the work against polishing wheel. The work passes by conveyor belt to finish polishing on the same type machine, using a No. 220 grit wheel.

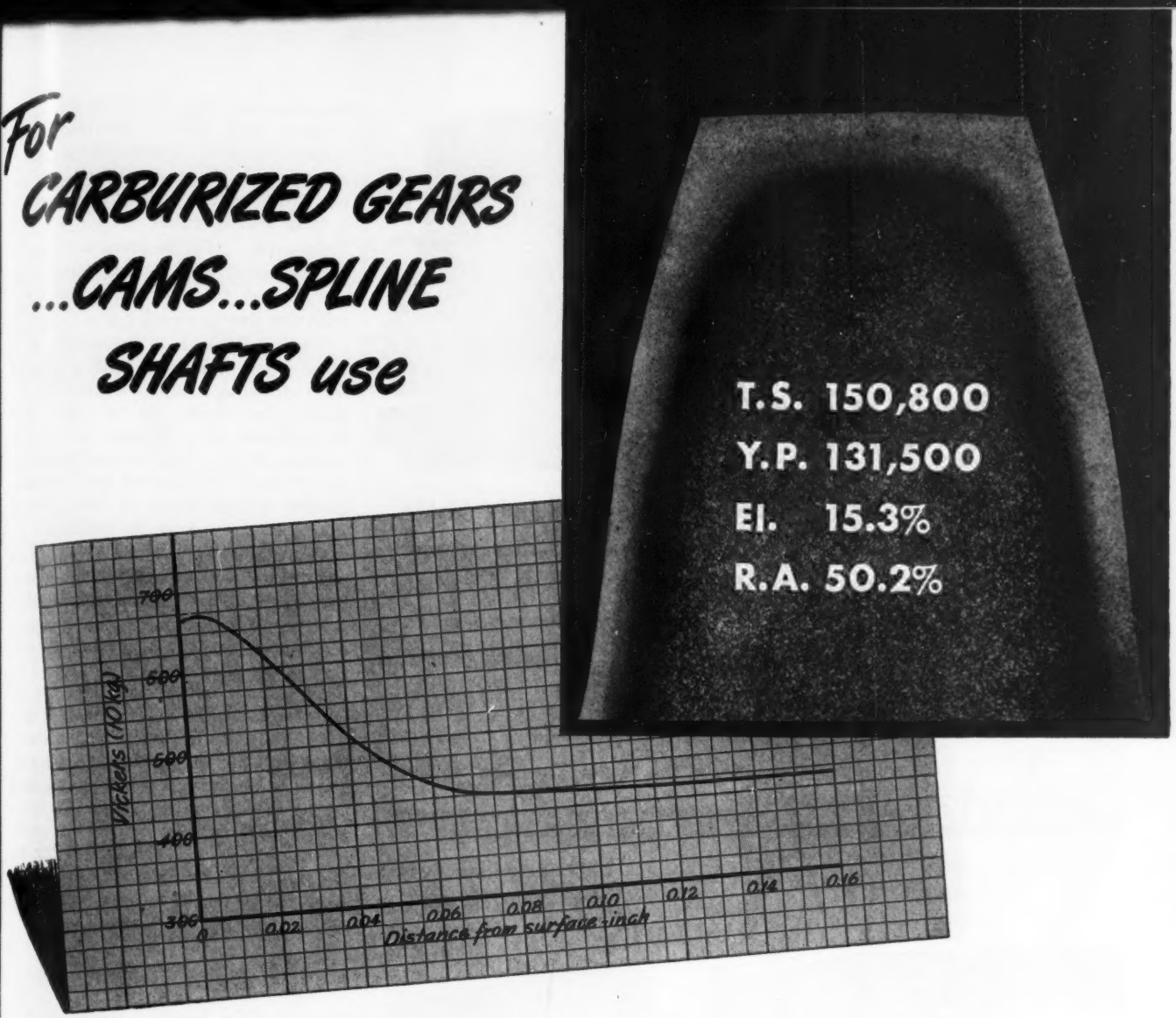
Rough polish of the stainless steel sides of the vessel is accomplished on a contoured wheel using No. 280 grit with a tapered hub in a lathe with tapered shaft. The polishing lathe is the same type (Rome MI 30 horsepower), and the work is similarly held. Next the stainless gets a sisal buff with a ventilated Codman & Co. cutting-buffing machine, and then a color buff, using a different compound. Finally, the copper bottom is color buffed and the outside and copper bottom of the saucepan is finished.

Inside of the vessel is then "sunrayed" to give eye appeal. This is accomplished on a lathe turning at 1200 revolutions per minute, work being held by vacuum chuck. The operator goes in with an emery tape, starts at bottom center, works outward across the bottom and outside to the top in concentric lines throughout.

Handles are then welded by a large battery of inclined Bliss presses in the general press department. They are projection welded to the pan proper on an Acme 50 kilovolt-ampere unit. The work goes to packing where it meets the cover.

Assembly—In the assembly, preparatory to packing, plastic handles are installed on the stainless steel handle

For CARBURIZED GEARS ...CAMS...SPLINE SHAFTS use



AISI A 6120 CHROMIUM-VANADIUM STEEL

TOUGH, ductile core for impact resistance—strong, hard case for wear-resistance—firm bonding for close integration of case and core. These essential properties of carburizing steel are obtained to a high degree in AISI A 6120 Chromium-Vanadium steel.

The outstanding core properties are demonstrated by the values (the average of six tests) superimposed on the accompanying macrograph of a gear tooth cross-section. These properties were obtained by the following heat treatment of 1-inch rounds: pseudo-carburize at 1675°, oil quench from pot, and temper at 350° F.

The fine-grained structure of the core, which is characteristic of all vanadium steels, and the firm integration of case and core are clearly shown in the macrograph.

The strong bonding is also graphically presented by the chart, which shows the gradual decrease in carbon penetration from case to core.

The excellent properties of these three—case, core and bonding—make A 6120 Chromium-Vanadium carburizing steel ideal for such vital parts as gears, cams, splines and bearings.

If you have a carburizing problem, our metallurgists will be glad to work with you in reaching a satisfactory solution.

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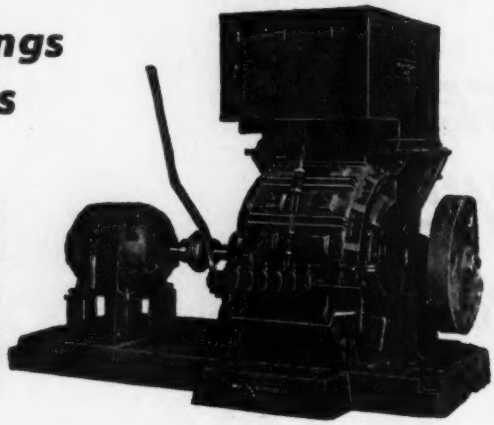

If you handle over 20 tons of turnings a month, you'll find it highly profitable to install an American Metal Turnings Crusher in your plant. Long, bulky, hard to handle turnings of alloy steel, carbon steel, aluminum, brass, copper or bronze are rapidly reduced to uniform chips, resulting in substantial savings in handling cost, storage space, cutting oil reclamation as well as better briquetting. Capacities to 10 TPH.

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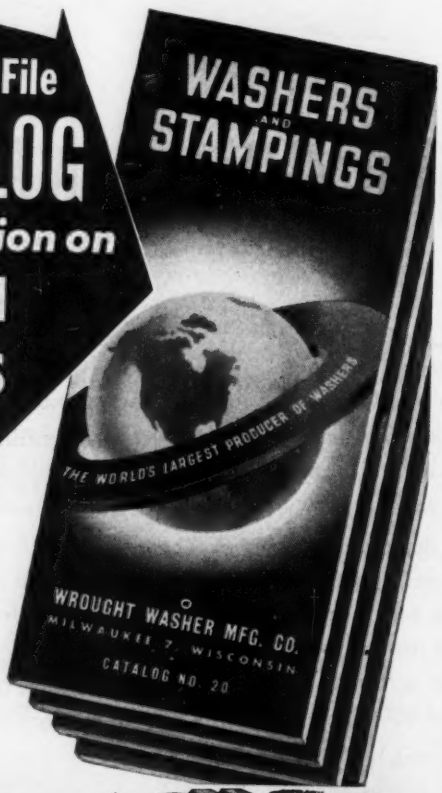

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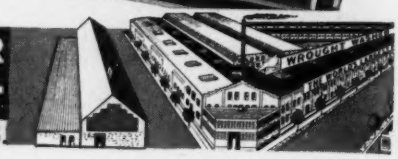

attachments, and the work is hand cleaned and labeled. Bottoms are stamped with the Thermic Ray trademark. Complete units are packed in individual cartons, 12 of these comprising a master case.

Saucepan cover receives a machining sequence and routing, timed to the second to meet final assembly with the vessel.

The cover blank is lubricated in a roller oiler pigmented with stainless steel drawing compound mixed in water. The draw is in No. 306 straightside Bliss against a double cushion. Work comes to trim by chute and a 21-B Bliss trims the flanges, leaving enough stock to bead. Work then passes by chute to beading.

Cover beading is done on a hand beading machine, parts being placed over the mandrel and rotated at 3000 revolutions per minute, the beading roll being fed in by hand lever. Covers are then boxed and trucked to wash, after which they receive a polish on the 30 horsepower Rome machine, using the same buffer technique as for the vessel. They are sunrayed in the same manner and then proceed to the Acme 15 kilovolt-ampere where projection weld of the cover stud is made. Moving to assembly, plastic knob is assembled to the stud, and the cover meets the pan at the packing station.

Relief Valve Helps Boost Pig Iron Output

Production increases in pig iron averaging about 20 per cent at the Buffalo plant of Republic Steel Corp., are made possible with a new turboblower protected from excessive pressures by a 12-inch, 125-pound air blast relief valve manufactured by R-S Products Corp., Philadelphia. Body and vane of valve are made of "H" metal for resistance to temperatures from 250° to 350° F.

Valve is opened and closed by a diaphragm top which is actuated by pressure controller adjusted to open valve at 40 pounds per square inch and close it when pressure drops below 39 pounds per square inch.

—o—

Many American and foreign technological reports distributed by Office of Technical Services, Department of Commerce, Washington, D. C., can be obtained at special service sales counter maintained by Government Printing Office in lobby of Commerce Department building. Reports available in photostat or microfilm form cannot be obtained at counter because several days are required to process reproduction orders.

"I didn't know you people made_____!"

Fill in to suit

We have been in business now for 58 years and yet quite often some good customer of our says — "Why, I didn't know you people made friction clutches!" Or the exclamation might cover skip hoist drives, car pullers, door hoists or any one of many other Jones products.

In dealing with our suppliers we often find ourselves in the same position. We establish certain buying habits and it sometimes comes as a shock to find that a firm right around the corner may have just the services or the products we need.

We therefore present the group of catalogs shown below with the thought that some one of them may help you solve some problem that has just come up.

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Any, or all of these Jones Catalogs sent on request

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No. 75—Jones Worm Helical Speed Reducers
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No. 60—Jones Friction Clutches
No. 58B—Jones V-Belt Sheaves
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No. 56—Jones Roller Bearing Pillow Blocks
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Jones

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PILLOW BLOCKS & FRICTION CLUTCHES • FLEXIBLE COUPLINGS

more power

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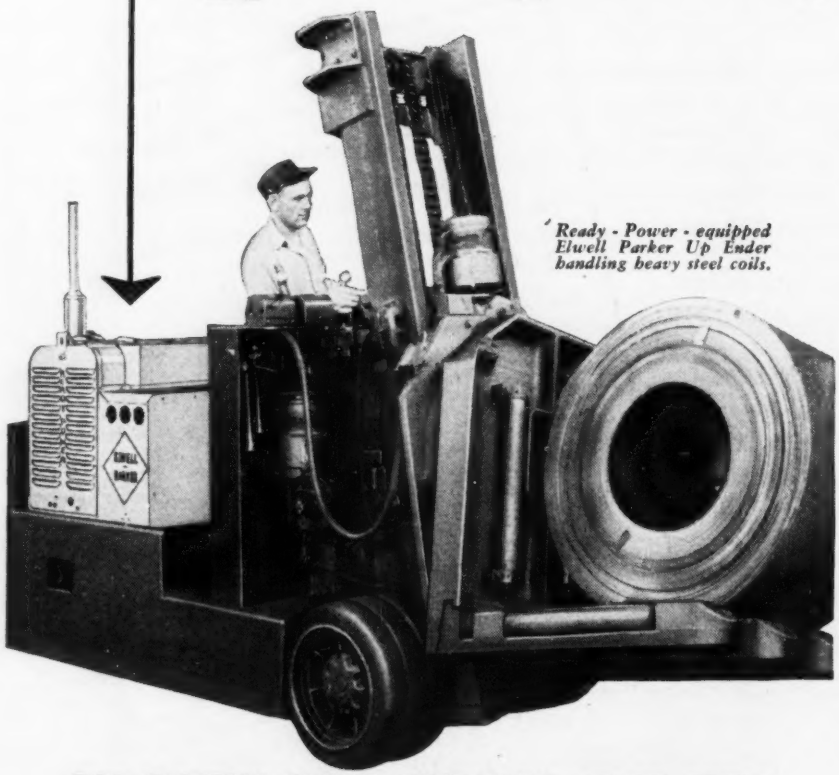
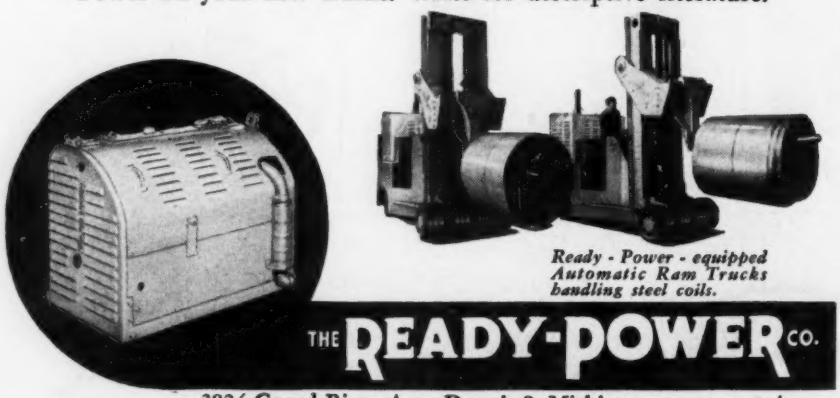


Ready - Power - equipped Elwell Parker Up Ender handling heavy steel coils.

FOR ELECTRIC TRUCK OPERATION AT ITS BEST!

Ready-Power-equipped electric trucks provide more power for heavy loads, more continuous hours of service and more materials handled in any given period. Dependable electric power is generated right on the truck chassis by an engine-driven, direct-current generator. Get the most out of your electric trucks. Convert them to Ready-Power. Specify Ready-Power on your new trucks. Write for descriptive literature.



Ready - Power - equipped Automatic Ram Trucks handling steel coils.

THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

Quality Control

(*Concluded from Page* 107)

act measurement of important characteristics of coil springs. Since the company feels that these instruments will soon come into widespread use, an understanding of their handling and importance is vital at this time.

Management men are invited to correspond with the company regarding particulars of the course and possible assignment of men to take it. Ten men can be enrolled at a time, and the company urges that all men from a given company come in a group.

Exclusive courses will be arranged for companies of sufficient size that have eight or more men to be trained. Although the first few weeks are filled up, the course will be continued until all qualified enrollees have been processed.

Quality Control Conferences Scheduled

Round table conference in quality control scheduled by College of Engineering, New York University will be held at Engineers Club, New York, on ten consecutive Wednesdays beginning March 3. Conferences will be conducted by Professor J. M. Juran and men from well-known industrial concerns.

Although no scholastic requirements are necessary for attendance, enrollment is limited to those persons whose present responsibilities permit them to initiate quality control programs in their own plants. These meetings are helpful to plant managers, operating executives, quality managers, chief inspectors, chief engineers, industrial engineers, product engineers and others who desire to reduce scrap losses and reworks, eliminate fitting and selection in assembly, improve service to customers while reducing frequency of complaints and minimize need for detailed inspection of product.

Sessions in quality control take up such subjects as case histories, specifications, tolerances, organization, personnel, building quality, incentives, quality audits and executive reports, statistical quality control and other allied topics.

—o—

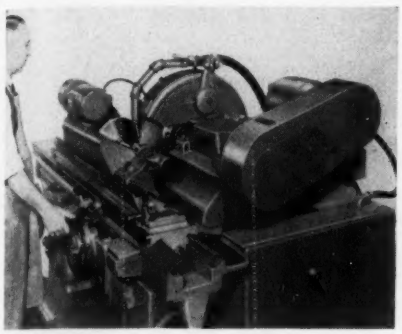
Ideal for tungsten carbide and high speed steel and cutting tools for single purpose mass-production operations is the detachable taper drive which eliminates necessity of drifting out cutter from holder. Manufactured by Eclipse Counterbore Co., Detroit, this tool will be introduced at American Society of Tool Engineers Show in Cleveland.

New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 146

1. Grinding Machine

Clearance for larger diameters and projections is provided by a 10-inch swing on the No. 10 and 12 plain grinding machines made by Brown & Sharpe Mfg. Co. Providence 1, R. I. The new 10 x 18 inch and 10 x 30 inch machines are designed for rapid cylindrical grinding of small and

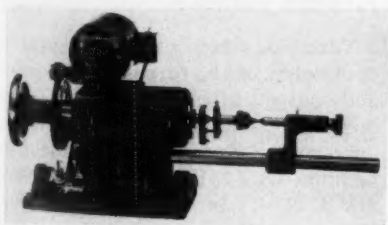


medium sized parts to close limits on a production basis.

Operated by simple hydraulic and electrical controls, once they have been set up they can be operated by two controls—a cross feed handwheel and a table start-stop knob. Spark-out time is minimized due to small clearance between spindle and its boxes. Machines have individual motor drives, cross feed mechanism with adjustment to 0.0001-inch on diameter and automatic oiling.

2. Radial Relief Fixture

Radial relieved cutting tools, used on screw machines and vertical type equipment for speeding set-up time, reducing machine running time and reducing maintenance costs, may be produced on a radial-relief fixture



developed by Glenbard Tool Mfrs. Inc., 216 North Clinton St., Chicago 6, Ill.

Indexing of the number of flutes desired from one to six is controlled by a simple gear change. Because of geared indexing, all teeth cut in a true circle. The work center line remains parallel to the axis of the grinder, allowing true dressed forms to be reproduced radially and spirally without trial-and-error or compensation. By reversing the actuating cam left hand work can be handled. By disengaging the actuating mechanism, tools may be cylindrically ground either in the collet or between centers of the fixture. After the form has been ground, the actuating mechanism can be engaged and tool can be radially relieved without removing the fixture from the machine.

3. Flexible Shaft Machine

Motor and variable speed drive mechanism are contained in a streamlined housing that covers all moving parts of the flexible shaft machine built by Stow Mfg. Co., Binghamton,

N. Y. Shaft is driven by V-belt stepped pulleys. Speed changes and belt adjustment are easily made by turning an eccentric spindle.

Flexible drive shaft is 6 feet long and has an oil resistant casing and coil reinforcement. Ball bearing handpiece is equipped with a detachable wheel arbor. Pedestal, suspended, low mount and bench type are offered with motors of various horsepower and speeds.

4. Magnet Crane

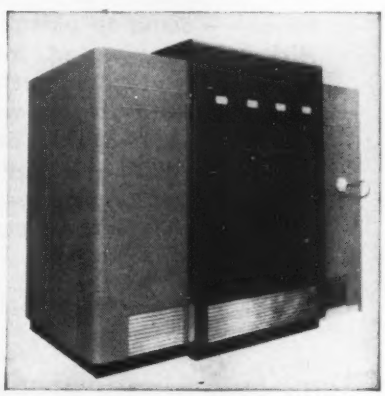
Handling of iron and steel screw and ferrous foundry products may be accomplished by the new one-man, single-engined, self-propelled magnet crane, manufactured by Wayne Crane Division, American Steel Dredge Co. Inc., Fort Wayne, Ind. Designated as model 22A, it has hydraulic steering, a 8-foot wheel base and a 22-foot turning radius.

Twenty-nine or 36-inch electromagnets, powered by 3 or 5 kilowatt generators, may be accommodated. It is equipped with a Rud-O-Matic magnet tagline reel and has oversized drums and clutches. The crane moves, lifts, booms and swings simultaneous-

ly or independently, traveling on four dual sets of standard pneumatic tires. It may be converted into a utility crane, clamshell or dragline, or with a 15-foot boom instead of the 30-foot standard, into a shovel or trench hoe.

5. RF Generator

Gear and automotive parts hardening or progressive and selective shaft hardening is possible with the 50 kilowatt, 450 kilocycle radio frequency generator and matching two-position work table with built-in sink, manufactured by Westinghouse Electric



Corp., Pittsburgh 30, Pa. Generator is assembled to include all control equipment, high voltage rectifiers, protective devices, oscillator tubes, radio frequency and coupling circuits in one unit.

Work table fits snugly against the cabinet front. It has a stainless steel sink. Multiple mounting bosses on the sink provide for easy installation

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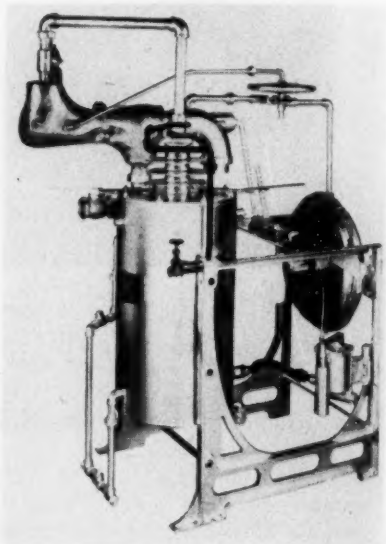
of work handling equipment. Dual fittings for quench and cooling water and two sets of heavy duty radio frequency output terminals are also on the table.

6. Gas Generator

A compact unit producing safe gas from fuel oil for all types of industrial ovens and furnaces is made by Vapofier Corp., 10316 South Throop St., Chicago 43, Ill. With foolproof alignment of parts, less weight and a cast aluminum chassis, the unit may be used as a gas standby because of its



quick switchover to gas without interruption of flame or change of flame quality.

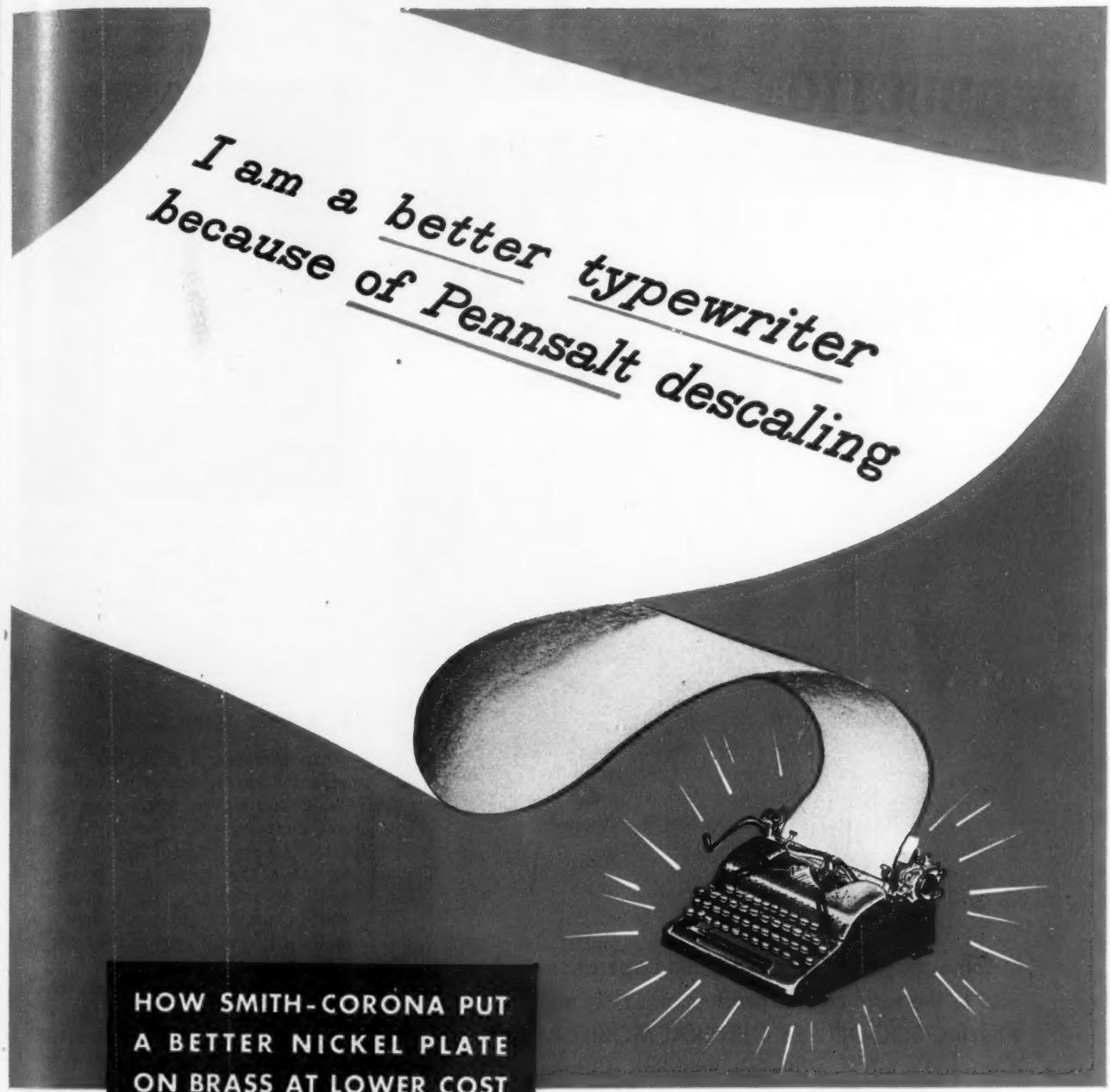
Generator automatically maintains constant pressure and air-gas ratios from a reducting to an oxidizing flame, with few moving parts. The gas produced is clean, sootless and has no contaminating odor.

7. Bath Furnace

Variables which cause a change in the quality of the furnace atmosphere and consequently in the nature of the metal surface are overcome in the universal batch furnace introduced by Lithium Co., 111 Sylvan Ave., Newark 4, N. J. Introduction of lithium vapor with the usual carrier gas into the heating chamber effects complete control of the atmosphere at the work. The protection of this vapor extends to the instant quenching or to air cooling, so that there can be no oxidation.

Furnace is suitable for heating in a temperature range from 1200 to 2100° F, providing fast, uniform heating under predetermined, automatically controlled conditions for neutral annealing, normalizing, hardening, spheroid-

I am a better typewriter because of Pennsalt descaling



HOW SMITH-CORONA PUT A BETTER NICKEL PLATE ON BRASS AT LOWER COST

To remove fire scale from brazed brass typewriter parts, L C Smith & Corona Typewriters Inc. had been pickling the parts in muriatic acid. They followed this with a scratch brush to remove smut. At best, the job was slow, and it was felt that the number of nickel plating rejects could be reduced.

The Pennsalt field representative spotted the trouble, and recommended a Pennsalt pickling medium. Result? Much superior pickling . . . scratch brushing eliminated. ". . . but best of all," said the plater, "the resulting plate is better, with little or no rejects."

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If you'd like more details on this case, write us for Case Report No. 62-7. It gives full facts on this job, plus interesting data on the Pennsalt product used. And it shows the kind of service you can expect when Pennsalt know-how goes to work for you.

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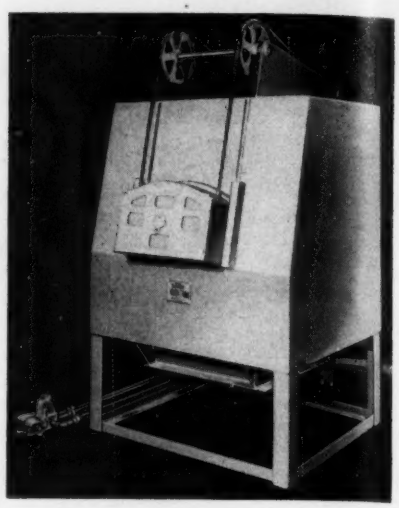
izing, etc. It is built for easy batch loading. Shell of furnace is of all welded reinforced steel plate, lined with



insulating refractory brick backed by insulating brick. The work chamber is an alloy steel muffle. It may be equipped for direct quenching without exposure of the work. Thirteen standard muffle sizes are manufactured.

8. Impact Wrench

Air operated, a new size No. 18-6 impact wrench, built by Keller Tool Co., Grand Haven, Mich., has a nominal capacity of 5/8-inch bolts and nuts. An air motor of the rotary type furnishes the speed and power for fast nut running. By means of a built-in torque regulator, power is adjusted to torque requirements of the individual job.

Tool can be operated in reverse by turning a reversing valve to serve in disassembly and dismantling operations. Length of the wrench is 8-7/8 inches and net weight is 9 pounds.

9. Bench Grinder

Equipped with a 1/3-horsepower, 3600 revolutions per minute, 110-volt single phase, 50 or 60 cycle totally

enclosed motor, the type 4BA84 bench grinder, added to the Cadet line of Standard Electrical Tool Co., 2504 River Rd., Cincinnati 4, O., has safety type enclosed guards, each of which is an exhaust outlet, adjustable spark breaker and work rest.

Machine is furnished with two 6 x 3/4 x 1/2-inch grinding wheels. The

distance between wheels is 16 inches and the height to center of spindle is 6-3/4 inches. Glass eye shields and floor pedestal with tool tray and water pot are available.

10. Chip Breaker Grinder

Designed for carbide chip breaker grinding, the model C-4 chip breaker grinder, made by Hammond Machinery Builders Inc., Kalamazoo 54F, Mich., has an any-angle vise with four swivels, each with a dial graduated in degrees. It has a capacity

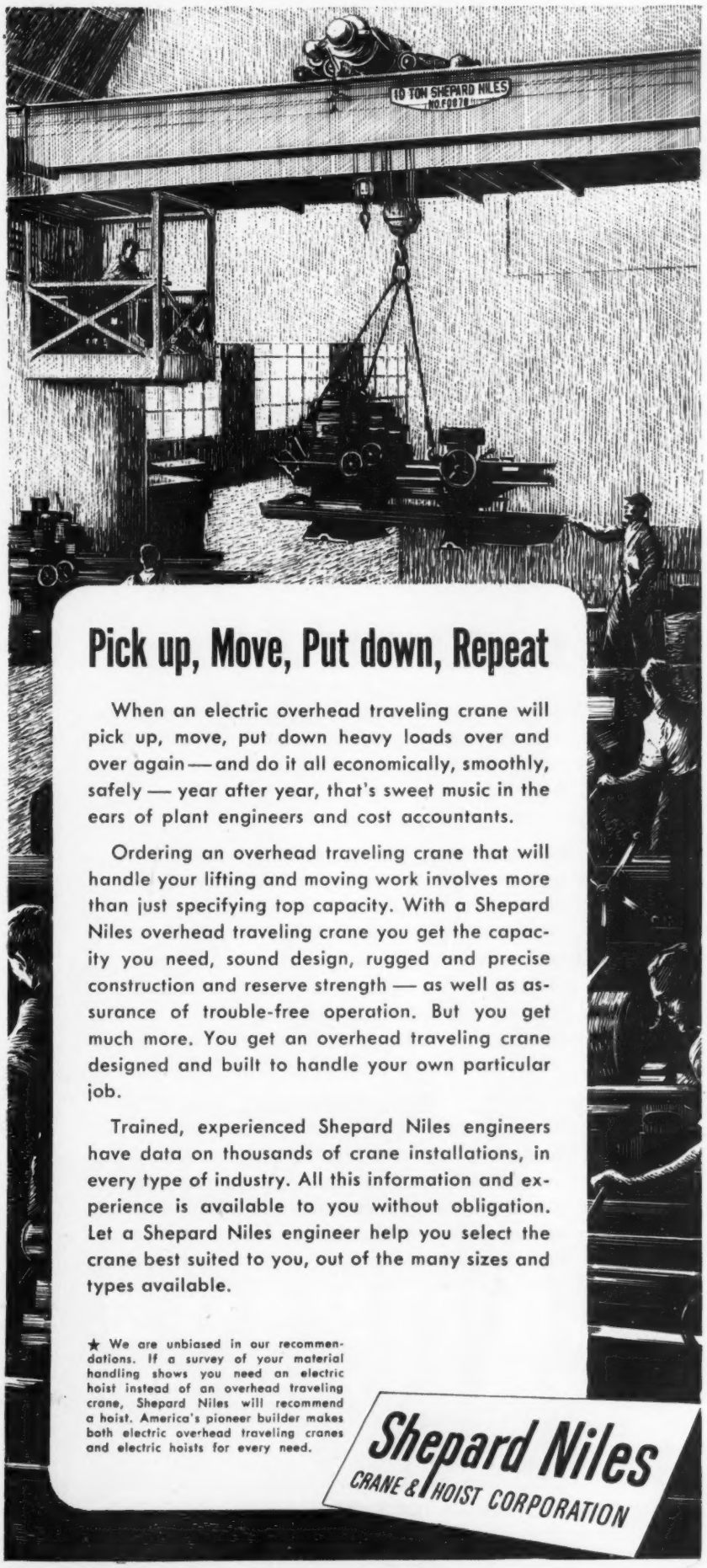
in all types of box and single point tools up to 2 inches. The reciprocating table is moved by a hand operated lever.

Spindle of the machine runs on bearings and the wheel has vertical and cross traverse. Dials are graduated to 0.001-inch. Moving parts are protected against grit and sludge. Table travel is 6 1/2-inches. Speed with 60 cycle direct current motor is 3500 revolutions per minute; with 50 cycle motor, 2900 revolutions per minute.

11. General Purpose Motors

Three new lines of general purpose Permamotors are announced by A. O. Smith Electrical Mfg. Co., Milwaukee 1, Wis. Fractional horsepower rating motors, integral horsepower ratings, single phase motors and integral horsepower ratings polyphase motors are offered. Fractional horsepower motors are capacitor start single phase type and are available in 56 and 66 frames with NEMA mounting dimensions. They feature squirrel cage rotors and bronze sleeve bearings.

Integral horsepower single phase motors are capacitor start type and are available in 1 to 5 horsepower in frame types 203, 204, 224 and 225. Starting capacitors are in starting windings but motors are essentially



Pick up, Move, Put down, Repeat

When an electric overhead traveling crane will pick up, move, put down heavy loads over and over again — and do it all economically, smoothly, safely — year after year, that's sweet music in the ears of plant engineers and cost accountants.

Ordering an overhead traveling crane that will handle your lifting and moving work involves more than just specifying top capacity. With a Shepard Niles overhead traveling crane you get the capacity you need, sound design, rugged and precise construction and reserve strength — as well as assurance of trouble-free operation. But you get much more. You get an overhead traveling crane designed and built to handle your own particular job.

Trained, experienced Shepard Niles engineers have data on thousands of crane installations, in every type of industry. All this information and experience is available to you without obligation. Let a Shepard Niles engineer help you select the crane best suited to you, out of the many sizes and types available.

★ We are unbiased in our recommendations. If a survey of your material handling shows you need an electric hoist instead of an overhead traveling crane, Shepard Niles will recommend a hoist. America's pioneer builder makes both electric overhead traveling cranes and electric hoists for every need.

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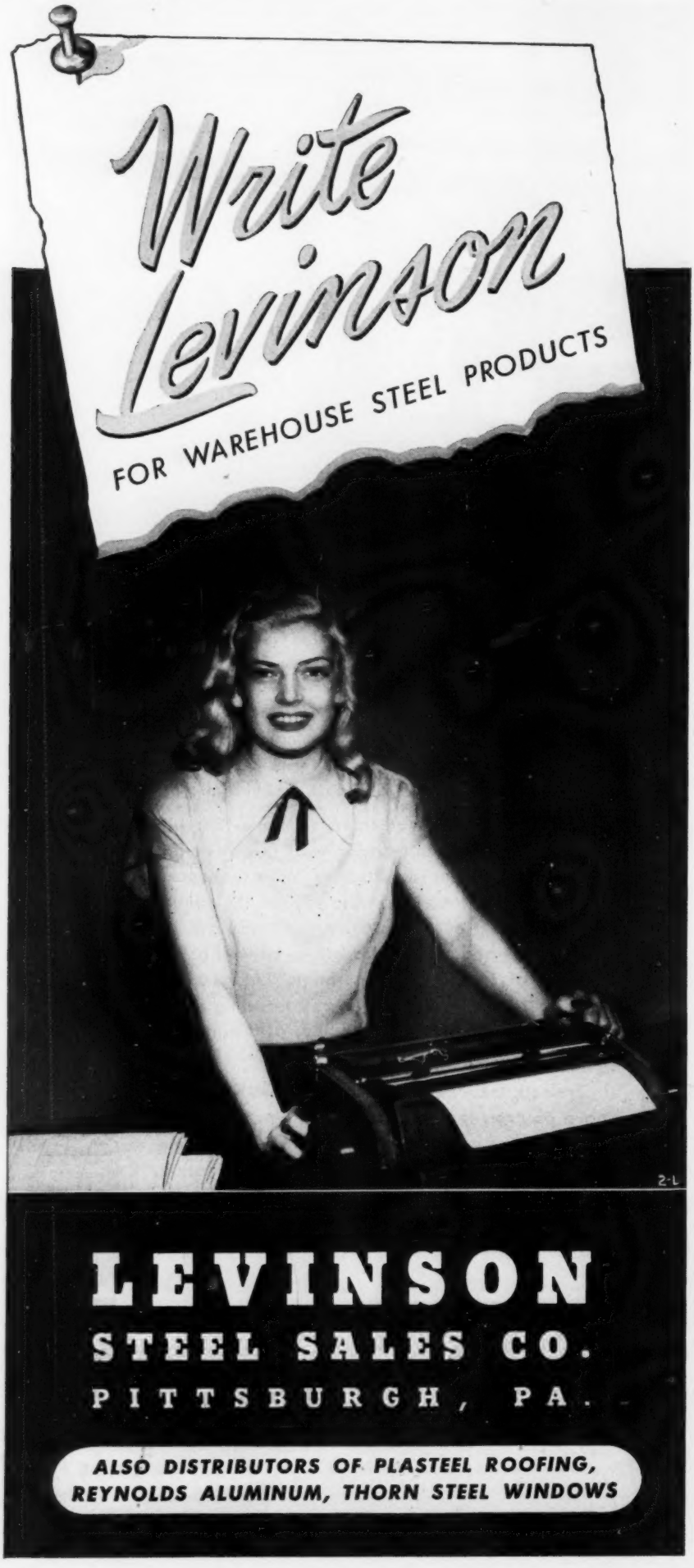


squirrel cage in design. Polyphase squirrel cage induction motors are offered in frames 203-326 with NEMA mounting dimensions. They are protected against liquids, falling objects and dust. Oversize ball bearings are interchangeable and die cast rotor has integrally cast ventilating fans.

12. Impact Nut Setter

Features of the Speed-O-Matic electric impact nut setter, introduced by Illinois Gage & Mfg. Corp., 4639 West Washington Blvd., Chicago 44, Ill., include faster operation, ease on the operator, high speed and portability. As it is torqueless, it will not twist in the operator's hands when the nut

becomes tight. Bolts or nuts are driven at speed of 1750 revolutions per minute at free speed.

At point of resistance the impact unit automatically delivers 3000 impact blows per minute. It may be reversed for removal of bolts and nuts. Operation is on any 110 volt, 60 cycle alternating or direct current circuit. Capacity is up to 3/4-inch nuts and bolts.

13. Vibrating Feeder

Jeffrey-Traylor Division of Jeffrey Mfg. Co., Columbus 16, O., is announcing an electric vibrating feeder with enclosed power unit for use where material to be handled is mag-

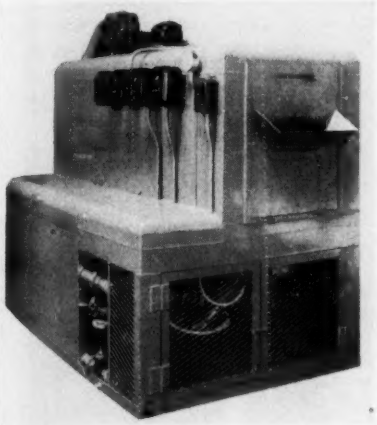
netic, hot, dusty and abrasive. Enclosed unit is dust tight, but is provided with cooling air inlet and outlet. Air may be circulated under a slight pressure as double protection against dust.

Power unit is provided with an ad-

justable support which allows for changing the slope of the feeder from 5 degrees up grade to 15 degrees down grade. This is accomplished by loosening four cap screws on the support and raising or lowering the deck end to suit.

14. Washing Machine

Three space-saving continuous rotary drum type washing units, built to process 700 to 900 pounds of small stampings or screw machine parts per hour, are announced by Industrial Washing Ma-



chine Division of Metal-Clean Solvent Corp., Chicago, Ill. They are completely automatic in operation.

Smallest of the three machines is a continuous spiral rotary drum type washing unit 3-1/2 feet long. The next size is a wash and dry machine 6 feet long (illustrated). Largest of the three is a wash, rinse and dry unit which is 9 feet long.

15. Fork Truck Attachment

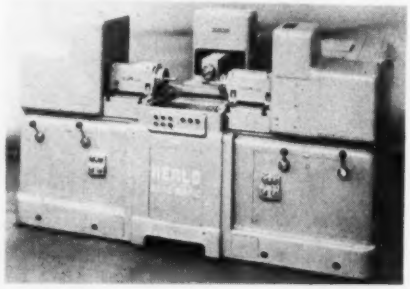
Clark Tructractor Division of Clark Equipment Co., Battle Creek, Mich., is announcing the improved Pul-Pac, a push-pull handling device which enables a fork truck to pick up, carry and tier a unit load based on a sheet of corrugated paper, fiber board or similar material. The truck attachment consists of a vertical movable rack which travels horizontally above the truck's broad carrying forks. A gripper device at the base of the rack grasps the projecting edge of the carrier sheet and is then retracted, drawing the load onto the forks. At destination the entire operation is reversed.

Whole operation is performed hydraulically, using power provided by the same system that actuates the lifting and tilting mechanism of the truck. Operation requires only that the load be accurately assembled on

the carrier sheet. Attachment is available for use on company's gasoline powered and battery powered Carloader line of fork trucks.

16. Boring Machine

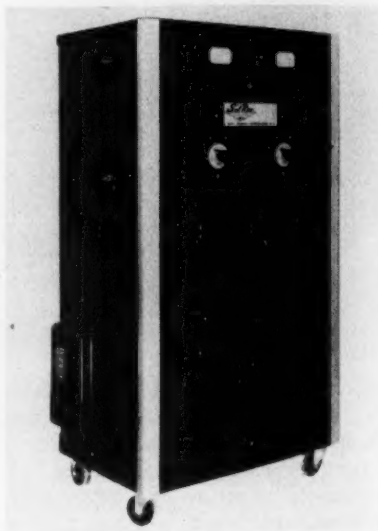
Made in two models, as a bi-way (models 232 or 332) or in two sizes as a tri-way (models 233 or 333), the new Bore-Matic machines, developed by Heald Machine Co., Worcester 6, Mass., are for boring two or more holes from various directions simultaneously. The combination of "way units" place as desired, provides for greatly increased production and close accuracy for relative axial location. Units may be operated separately.



Up to three individual boring heads or special multispindle head units may be installed on each "way unit". Other features include isolated motor and pump units, improved idlers and cylinders and automatic way lubrication. Machines are capable of boring, turning, chamfering, facing, grooving and fly-cutting.

17. Selenium Rectifier

Primarily designed to permit a reserve of voltage for platers desiring to use diluted solutions of chromic acid or other baths to conserve materials, a new 9-volt, 2500 ampere selenium rectifier, announced by Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y., has efficiencies of over 72 per cent at full load up to 83 per cent at 20 per cent load.



Unit has a tap switch adjustment of output which provides voltage adjustment without breaking current to the tank. Design has selenium elements over 7700 square inches of effective rectifying area. It has overload protection, magnetic starter and pushbuttons, Weston meters and shunt and is Tryon lined.

18. Gaging Machine

Automatic segregation of lapped finish parts into 27 classifications without marring their finish is accomplished by gaging machine developed by Sheffield Corp., Dayton 1, O. Parts too delicate to be hopper-fed are hand-fed into a vertical loading stack. A motor driven slide pushed the part from the stack to gaging position. By means of air-flow jets and Sheffield Airlectric gaging heads, parts are segregated into three 0.0004-inch major classifications of diameter.

Each of these three major classifi-

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This 2,000-ton self-contained HYDROLECTRIC Forming Press can do a big job for Hot Die-Forging or Forming . . . and do it well, automatically. Standard equipment contains a centralized control system, fully automatic, semi-automatic or manual operation . . . just by setting the selector switch. A special die-setting control available, providing sensitive platen movement. For more details, or engineering advice, ask R. D. Wood Company, Public Ledger Building, Independence Square, Philadelphia 5, Pa.

HYDRAULIC PRESSES AND VALVES FOR [illegible] • ACCUMULATORS • INTENSIFIERS

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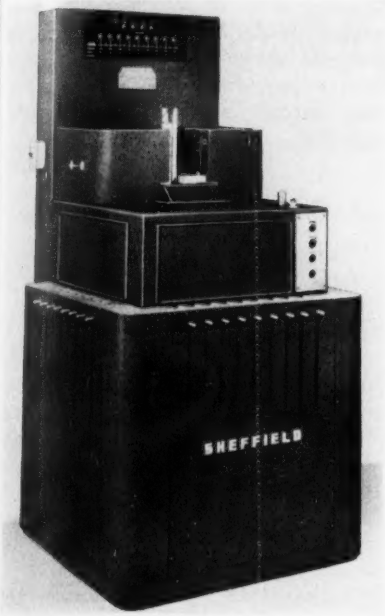
cations are further checked and segregated into eight acceptable 0.0003-inch classifications of thickness. Rejected parts are segregated into three classifications. Rate of inspection is



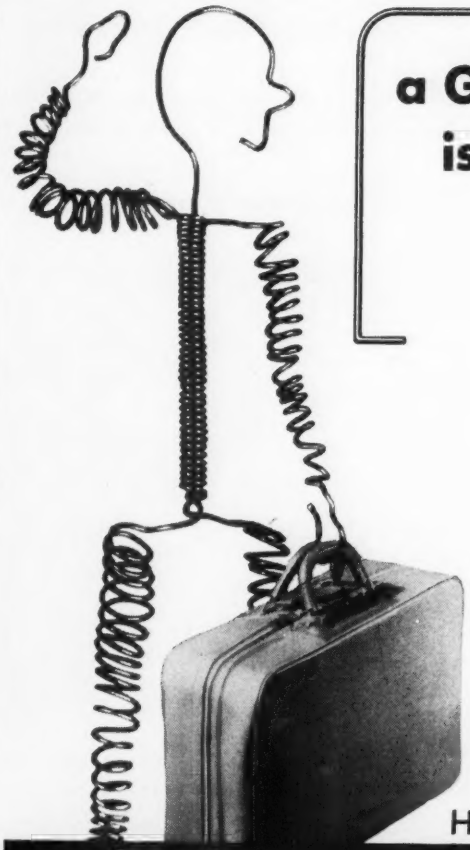
3000 pieces per hour at 100 per cent efficiency. Each classification has a sloping chute to its receiving station. When any one of these chutes is filled to its capacity of 100, the machine automatically stops.

19. Portable Conveyor

Powered by gas engine or electric motor, new Serv-A-Belt portable conveyors, built by Sermat Conveyor Corp., 2350 West 58th St., Chicago,

Ill., are made in 14 and 24 foot models. They have a tough rubber ply canvas construction belt and are designed for handling all bulk materials as well as castings and machined parts.

Features include a hydraulic lift for raising the conveyor to any position from level to 37 degrees. For



a GOOD *FRAME* is IMPORTANT

HINSON* Luggage Frames

made of KEYSTONE MUSIC SPRING WIRE

X-ray view of Hinson Pax-Lite bag showing sturdy framework of Keystone Music Spring Wire.

Hinson luggage is designed to keep its shape and trim style throughout extreme hard usage.

An important hidden feature of Hinson luggage is the Keystone Music Spring Wire frame. Keystone Music Spring Wire is specified because it retains its resiliency and resists the slightest tendency to sag under strain. The light weight, toughness and structural soundness of Keystone Music Spring Wire make it ideal for this important framework job.

We are indeed proud that Keystone Music Spring Wire is a recognized factor in the fine construction of Hinson luggage.

*HINSON MFG. CO.
WATERLOO, IOWA

KEYSTONE MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE CO., Peoria 7, Ill.

portability it is equipped with 4.00 x 8 pneumatic tires and automobile type springs. Optional are 6.00 x 16 tires. Belt has 1 inch cleats cushioned in the rubber. A large hopper and a trailer type hitch are included.

20. Generator

Twenty-three sizes and models comprise the new line of industrial gasoline engine electric generator sets offered by Buda Co., Harvey, Ill. Available in alternating and direct current output, single or three phase, the generators have capacities from 10 to 125 kilowatts. Each set is equipped with controls, generator, radiator and engine mounted on a self-contained base.

Gasoline, butane or natural gas engines are water cooled and compactly built. They have a full circulating pressure system of lubrication, electric starter, lubricating filter and air cleaner. Generator is direct connected, of single ball bearing, heavy duty, drip-proof construction and conforms to AIEE and AEME standards. Control panel has voltmeter, ammeter, circuit breaker, rheostat and engine controls.

21. Temperature Controllers

Temperature controllers in a series designed for use with electric and gas heating units are announced by K. H. Huppert Co., 6830 Cottage Grove Ave., Chicago 37, Ill. Offered with or without pyrometers, the step-

less input controllers are suitable for furnaces, ovens, pots and other similar applications.

Controller, called the Infi-Trol, operates by allowing a small portion of current to go through the heating elements, an amount sufficient to maintain definite temperatures. Gas equipment is controlled through a solenoid valve. Model IF 4 is pyrometer-equipped and calibrated to 2000°F, but is available in other ranges. Model IF 2 has no pyrometer but is otherwise identical. Both models operate on 115 volt alternating current (220 volt on special order).

22. Parts Conveyor

Using a steel link type conveyor belt, a new parts conveyor designed by Howard Engineering & Mfg. Co., 2235 Buck St., Cincinnati 14, O., is well suited for heavy duty use in handling sharp metal parts or heated material. Standard model is 8 feet 6 inches long and its belt is 16 inches wide. Loading height is variable from 9 to 24 inches, discharge height from 33 to 70 inches. Longer and shorter units with varying belt widths are available.

Standard belt is of 16-gage steel stampings space to provide a 9/16-inch square mesh. Meshes of 1 1/16 and 2 7/16-inches can be furnished. Belt is supported and driven by two

(For more information, use the card following page 146.)

★ *Translation—"Top Quality"*

What's in a Name?

Take, for example, the name, "AVONDALE". To our customers, all over these United States—"AVONDALE" means—what? It means the best in STEEL "Shipbuilding" and tops in Engineering "Know-How" and "Carry-Through".
To any and all, wherever the name "AVONDALE" is read or heard . . . it is quality, the same as Sterling is to silver.

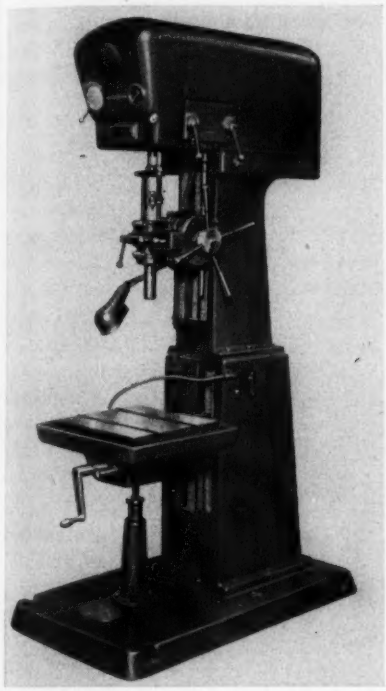
AVONDALE MARINE WAYS, INC.

RIVER FRONT, NEW ORLEANS DISTRICT — MAIN PLANT, AVONDALE, LA.
TELEPHONES: WALNUT 8970 - CHESTNUT 5853 — QUICK REPAIR PLANT - HARVEY, LA.
MAILING ADDRESS: WESTWEGO, LOUISIANA

exterior strands of 3-inch steel roller chain. Steel cleats on 12-inch centers prevent back-sliding. A 1/4-horsepower gearhead motor provides a belt speed of 40 feet per minute.

23. Drill Press

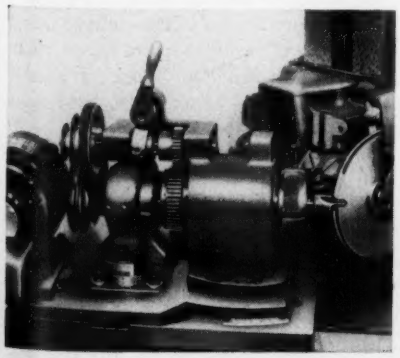
An infinite range of speeds between 150 and 3400 revolutions per minute is offered by the Infi-Speed drill press, developed by Canedy-Otto Mfg. Co., Chicago Heights, Ill. This fine



adjustment of spindle speeds allows for a more precise adjustment to the material being worked, increases operating efficiency and increases drill life. Press is offered with or without a 9-speed power feed.

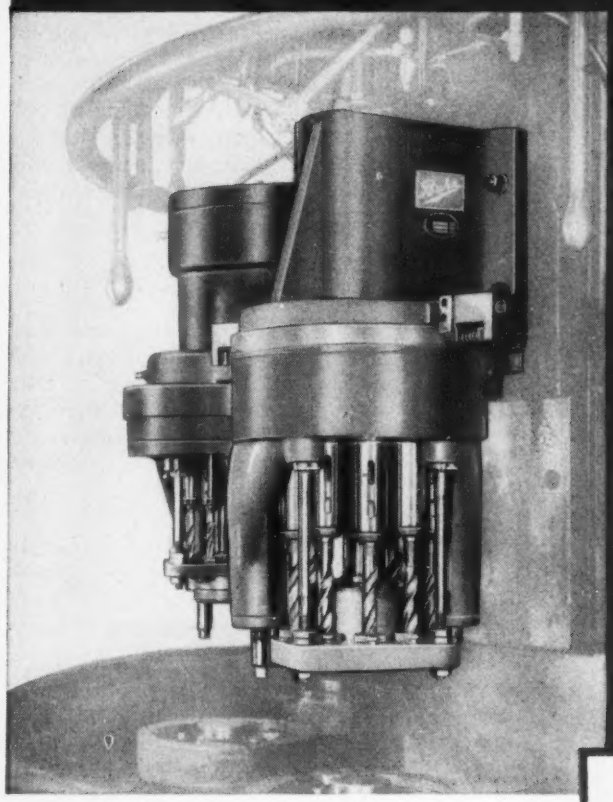
24. Grinding Attachment

Grinding form relief or radial relief or both at one time may be accomplished with the circularity grind-

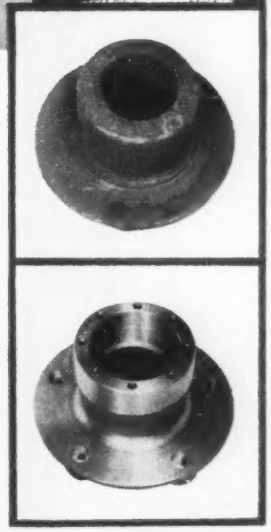


ing attachment announced by Detroit Reamer & Tool Co., 2830 East Seven Mile Rd., Detroit 12, Mich. It is made

ROTO-HED . . .



TURNS AS IT DRILLS AS IT REAMS



ONE machine — ONE operator — ONE handling . . .
MORE goods — LOWER cost — HIGHER efficiency . . .

Simple — because the Buhr Roto-hed, designed to *rotate with* the work, performs required multiple drilling, reaming, counterboring, chamfering and like operations *simultaneously* with vertical-lathe turning, boring or facing. Many thousands of grueling hours "on the line" have proved Roto-hed invaluable for *volume* production of flanges, hubs, wheels and similar parts. This special type of multiple spindle drill head can be adapted to various vertical turning machines.

The Roto-hed is a typical product of the thinking which has guided Buhr Machine Tool Company throughout its 23 years of designing and building high-production tools, machines and equipment. Specialists in multiple spindle drilling and tapping equipment — complete machines, heads and re-tooling of special and standard machines — Buhr has developed advanced techniques in the design of all auxiliary tooling, fixtures, powered index tables and other aids to production. Buhr cuts no corners in design, material or workmanship, so remember . . .

Truck wheel hub before loading in vertical turning machine — and as unloaded with all turning and drilling operations completed.

Be Sure . . . Specify Buhr!

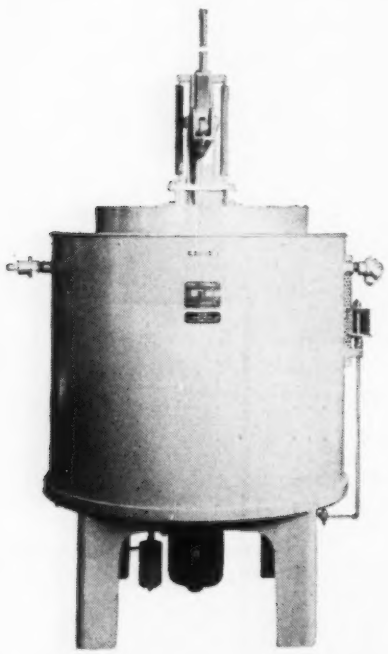
Buhr MACHINE TOOL CO.

to fit on any conventional cylindrical or cutter grinder, and when not being used for its intended purpose, it serves as a conventional motor driven headstock.

As the spindle of the attachment revolves, a cam generates the relief in the tool. Amount of relief is changed by scale adjustment. Work may be held in a collet chuck with capacity from 0 to 1 1/4-inches or between centers.

25. Tempering Furnace

Homo furnaces for continuous high precision tempering at 1650°F are announced by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. High temperature stress relief,



cycle annealing, spheroidizing, normalizing, etc. may be performed, along with low temperature work. Line of furnaces has ribbon type heaters and fan motors with a water cooled gland.

Furnaces have capacities from 1.8 to 33.4 cubic feet. Compact and clean running, they need little space for installation in pits or on the floor. Operating costs are low, because of the large load capacity, fast heating and uninterrupted operation.

26. Stacking Truck

Movement and stacking of materials on skid platforms, pallets or in sectional bins is possible with the Jack-Stacker, built by Lewis-Shepard Products Inc., 285 Walnut St, Watertown 72, Mass. Suitable for operation in narrow aisles, congested areas, freight cars and where floor and elevator capacities prohibit use of heavier equipment, the truck is offered with capacities up to 4000 pounds and in four models.

Electro-hydraulic lifting and lowering and the gear drive traction unit are battery powered through series wound electric motors. All controls are mounted in the handle head. Master drive unit, including traction mechanism, is mounted on articulated linkage to insure traction on uneven surfaces.

DEVELOPED BY . . .

27. H. K. Porter Inc., Somerville, Mass., redesigned line of hand power cutters for bolts, rods, wire, chain, bars, etc. Features include jaws marked with capacity, safety stop, greater handle strength, no protruding screws.

28. Rapidesign Inc., Glendale, Calif., Radius Master No. 76 for rapid and accurate drawing of radii. Radius point of plastic instrument is located by the center hole serving the particular radius.

29. Speco Inc., Cleveland 14, O., Heat resistant paint made specifically for metal surfaces where temperatures reach 1500°F. Paint will setup in 4 hours and dry overnight.

30. Larrimore Sales Co., St. Louis 1, Mo., inspection lens with a 6 1/2 inch diameter and 6-inch diameter of visibility. Lighting is provided by two 6 watt fluorescent tubes.

31. Reltool Corp., Milwaukee, Wis., slitting saw for plastics and light metals. Teeth are ground with alternate right and left hand pitch for free cutting and elimination of chips.

32. Cadillac Cutter Co., Grand Rapids 7, Mich., double end mills with three cutting edges. Tool is made without conventional center hole in end allowing milling straight down in the work before starting cut.

33. Manufacturer's Engineering Service, Toledo 4, O., drill jig (model 750) accommodates standard slip bushing $\frac{1}{32}$-inch hole size. Double-end anvils take round work stock from 1/8 to 3/4-inch.

34. M. E. Cunningham Co., 170 Carson Street, Pittsburgh, Pa., marking holder for numbering, coding and inspection. Holder sizes range from 1/4 to 2-inch slots, and will take nine sizes of type characters.

35. Manco Mfg. Co., Bradley, Ill., hand cutter to fit between wire cutting pliers and bolt cutters. This cutter is 12-inches overall and can be used to cut mild steel bolts up to 1/4-inch.

36. Erickson Tools Division, Cleveland 14, O., pull chuck used with Heald Gagematic providing a rapid change of parts for precision grinding.

37. Spiral Mfg. Co., Chicago 41, Ill., electric driven graph chart with a capacity of 2000 items for all plant operating data. Chart can be rotated from end to end in 45 seconds.

38. General Electric Co., Pittsfield, Mass., two modified phenolic liquid adhesives for cementing metals, thermosetting plastics, and use with other materials. Both bonding agents have high shear and tensile strength.

39. Schaefer Brush Co., Milwaukee 4, Wis., stainless steel brushes for cleaning the inside of fittings. Brushes are available for fittings from 1/4 to 2 1/8-inches outside diameter.

40. J. A. Zurn Mfg. Co., Erie, Pa., high pressure Y-type strainer for pressures up to 600 pounds available in standard sizes or to specification. Unit is suitable for close quarter installations.

41. Square D Co., Milwaukee 12, Wis., pressure switch designed for machine tool and welder industries. Operating rates up to 300 per minute, without false operation or flutter, have been confirmed by operation tests.

42. Clark Clutch, Rockford, Ill., a mechanically actuated automatic clutch. Slip period in this clutch is controllable to provide desired characteristics.

43. Wagner Brothers Inc., Detroit 3, Mich., zinc anode of distinctive design to prevent confusion with cadmium or tin ball anodes. Anode's smooth surface is free from gates and flash, and plating area is from 20 to 25 per cent greater than ball of like diameter.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL PRICES—Seldom in the past has an adjustment in steel prices kicked up such a ruckus as has followed in the wake of the recent advance in semifinished steel quotations. Ever since the increase became generally known reports of FBI investigations, anti-trust law prosecution, congressional hearings and expressions of indignant official resentment have poured out of Washington.

While it is thought by many observers that the steelmakers' action may have been ill-timed, the fussing and fuming in government circles came as a distinct surprise all around. Relatively few companies are involved in the price change, and even more pertinent, only about 4 per cent of all steel shipped in commerce is in the semifinished category.

FURTHER ADJUSTMENTS—No additional price changes have been reported over the past week. It is expected, however, some nonintegrated producers of finished steel products will effect a revision in their quotations. As a matter of fact, at least two smaller interests already are reported to have adjusted prices upward on sheets. There is no indication all nonintegrated and semi-integrated mills will take similar action, however.

Ultimate effect of the semifinished increase on finished products, particularly those that have not been advanced in the recent past, remains to be seen. There is no indication at the moment, however, any general rise is in prospect in view of the statements of the leading interests that the semifinished action was limited in scope and in no way indicated any trend in general steel prices.

STEEL's composite price average for steelmaking scrap last week eased slightly to $40.17 from $40.58 the previous week and compared with $34.33 a year ago. Other composite market averages held unchanged at $81.14 for finished steel, compared with $69.82 for the like 1947 week; $68.72 for semifinished steel compared with $52.10 a year ago; and $39.38 for steelmaking pig iron against $29.67 a year ago.

RISING COSTS—Production costs in the steel industry have continued to rise. Should this uptrend continue it is logical to assume there will be compensating adjustments in steel prices. With respect to recent revisions in prices these reflect past increases in costs.

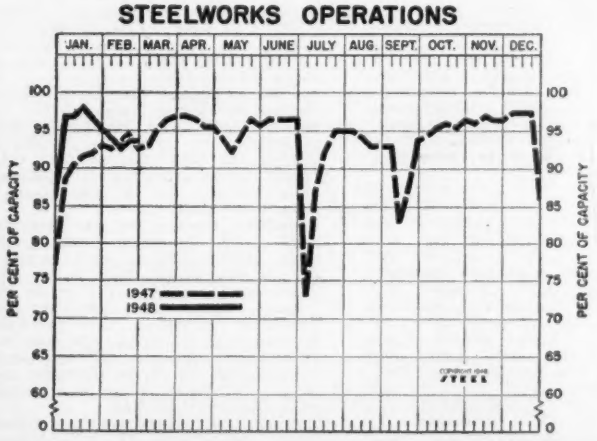
The recent price revisions confirm industry leaders' observations that any major increase in costs, such as a wage boost in a basic industry, or a general freight rate increase, starts a wave of price adjustments which takes weeks, sometimes months, to run its course. Recently, the steel industry has been undergoing such experience, railroad freight rate increases being the latest factor affecting steel costs.

SCRAP EASES—Signs are multiplying of growing easiness in iron and steel scrap prices. Steelmaking grades are reported off 25 cents to $1.50 per ton from the steel mills' buying formula, and the easiness extends from eastern points west to Chicago. Tonnage flow is increasing with milder weather, and brokers at Pittsburgh are obtaining metal readily to fill commitments against the recent sale of 200,000 tons to a leading steel producer. All signs would seem to point to definite passing of the peak in scrap.

STEEL DEMAND—Tight supply conditions continue unchanged in the major demand products with consumers pressing for all the tonnage they can get. Except for a little more caution in ordering, the recent break in the commodity markets has not been reflected in steel demand.

OPERATIONS—Estimated national steelmaking rate held unchanged last week at 93.5 per cent of capacity. Operations were 2 points higher at Pittsburgh and in New England at 93 and 85 per cent, respectively, and were 5 points lower in St. Louis at 77.5, and ½ point lower in Chicago at 92 per cent.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Feb. 28	Change	Same Week 1947	Same Week 1946
Pittsburgh	93	+ 2	93	71.5
Chicago	92	— 0.5	92	61
Eastern Pa.	91	None	88	36
Youngstown	102	None	89	60
Wheeling	90	None	93.5	86
Cleveland	95	None	90.5	77
Buffalo	86	None	90.5	44
Birmingham	100	None	99	57
New England	85	+ 2	92	75
Cincinnati	90	None	87	70
St. Louis	77.5	— 5	74.5	54
Detroit	89	None	87	64
Estimated national rate	93.5	None	92.5	56

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Feb. 28	Feb. 21	Month Ago Jan. 1948	Year Ago Feb. 1947	5 Years Ago Feb. 1943
Finished Steel	$81.14	$81.14	$78.26	$69.82	$56.73
Semifinished Steel	68.72	68.72	60.42	52.10	36.00
Steelmaking Pig Iron	39.38	39.38	38.50	29.59	23.00
Steelmaking Scrap	40.17	40.58	40.75	33.50	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Dec. 1947	3.49055c
Nov. 1947	3.47536c
Dec. 1946	2.91932c
Dec. 1942	2.38793c

* Straight Arithmetical Composites: Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Finished Steel arithmetical composite, dollars per net ton on net ton basis; others, gross ton.

† Finished Steel Weighted Composite: Computed in cents per pound, base prices, weighted by actual monthly shipments of following products representing 80 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates; standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others, dollars per gross ton.

Finished Materials

	Feb. 28, 1948	Jan., 1948	Nov., 1947	Feb., 1947
Steel bars, Pittsburgh	2.90c	2.90c	2.90c	2.60c
Steel bars, del. Philadelphia	3.356	3.348	3.318	2.98
Steel bars, Chicago	2.90	2.90	2.90	2.60
Shapes, Pittsburgh	2.80	2.80	2.80	2.50
Shapes, del. Philadelphia	2.968	2.966	2.954	2.64
Shapes, Chicago	2.80	2.80	2.80	2.50
Plates, Pittsburgh	2.95	2.95	2.95	2.65
Plates, del. Philadelphia	3.19	3.186	3.17	2.85
Plates, Chicago	2.95	2.95	2.95	2.65
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.50
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.20
Sheets, No. 10 galv., Pittsburgh	3.95	3.93	3.90	3.55
Sheets, hot-rolled, Gary	2.80	2.80	2.80	2.50
Sheets, cold-rolled, Gary	3.55	3.55	3.55	3.20
Sheets, No. 10 galv., Gary	3.95	3.93	3.90	3.55
Strip, hot-rolled, Pittsburgh	3.05	2.80	2.80	2.50
Strip, cold-rolled, Pittsburgh	3.80	3.55	3.55	3.20
Bright basic, bess. wire, Pittsburgh	3.775	3.675	3.675	3.425
Wire nails, Pittsburgh	5.20	4.67	4.625	4.125
Tin plate, per base box, Pittsburgh	$6.70	$6.70	$5.75	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00*	$60.00*	$50.00*
Slabs, Pittsburgh, Chicago	45.00	47.50*	47.50*	42.00*
Rerolling billets, Pittsburgh	45.00	47.50*	47.50*	42.00*
Wire rod ⅜ to ¼-inch, Pitts.	3.175c	3.10c	3.05c	2.55c

* Per gross ton.

Pig Iron

	Feb. 28, 1948	Jan., 1948	Nov., 1947	Feb., 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$40.996	$40.379	$37.913	$31.83
Basic, Valley	39.00	38.40	36.00	30.00
Basic, eastern del. Philadelphia	42.004	41.372	38.84	32.01
No. 2 fdry., del. Pgh. (N.&S. sides)	40.496	39.879	37.418	31.33
No. 2 fdry., del. Philadelphia	42.504	41.871	39.34	32.51
No. 2 foundry, Chicago	39.00	38.60	36.00	30.50
No. 2 foundry, Valley	39.50	38.50	36.50	30.50
Southern No. 2, Birmingham	37.88	34.88	34.88	26.88
Southern, No. 2, del. Cincinnati	40.74	37.74	38.844	31.75
Malleable, Valley	39.50	38.90	36.50	30.50
Malleable, Chicago	39.50	39.10	36.50	30.50
Charcoal, low phos., fob Lyles, Tenn.	55.00	50.00	46.40	37.50
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.30	$40.00	$34.40
Heavy melt. steel, No. 2, E. Pa.	39.00	41.30	41.625	33.25
Heavy melt. steel, No. 1, Chicago	38.75	39.05	38.75	31.25
Heavy melt. steel, No. 1, Valley	40.25	40.04	39.875	34.25
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.625	32.50
Heavy melt. steel, No. 1, Buffalo	44.00	43.30	41.81	34.00
Rails for rerolling, Chicago	49.75	60.00	56.25	38.50
No. 1 cast, Chicago	66.00	63.50	49.00	42.50

Coke

Connellsville, beehive furnace	$12.50	$12.50	$12.25	$8.875
Connellsville, beehive foundry	14.875	14.60	14.50	10.00
Chicago, oven foundry, del.	19.25	19.19	18.60	13.19

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56, per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45; Cleveland, $47; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom.; sales in open market $95-$105 per gross ton.

Skelp: Pittsburgh, Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70; some sellers quoting up to $120.

Wire Rods: Pittsburgh, Chicago, Birmingham, ⅜ to ¼-inch, inclusive, $2.80-3.55 per 100 lb. ⅜ to ⅛-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.06c; eastern Mich., 3.13c; New York, del., 3.392c; Phila., del., 3.356c; San Francisco (base, del.), 3.6345-3.95c; Los Angeles (base, del.), 3.629-3.86c; Seattle, 3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.71c; Toledo, 3.78c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.85c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-†7.70c, double refined 8.90-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

† Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.96c; eastern Mich., del., 3.03c; Philadelphia, del., 3.04c; New York, del., 3.172c; Los Angeles (base, del.), 3.544c; San Francisco, (base, del.), 3.5495c. (Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.71c; Eastern Mich., del., 3.78c; New York, del., 4.042c; Philadelphia, del., 4.006c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, 3.95c; Youngstown, Sparrows Point, Canton, Middletown, base, 3.95c; Granite City, 4.35c; New York, del., 4.322c; Philadelphia, del., 4.19c; Los Angeles (base, del.), 4.724c; San Francisco (base, del.), 4.7295c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.55c; copper-iron or pure iron, 4.90c Granite City 5.00c and 5.35c, respectively. Los Angeles (base, del.), 5.344c; San Francisco (base, del.), 5.3495c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Stainless-Clad 20%: Pittsburgh, Washington, Coatesville, Pa., No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c. Prices include annealing and pickling.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 3.85c; Granite City, 4.05c; Detroit, del., 4.11c; eastern Mich., 4.18c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. Electrical: Pittsburgh, Chicago, Gary, 5.35c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. Motor: Pittsburgh, 6.05-6.80c; Chicago, Gary, 6.05c; Granite City, 6.50c. Dynamo: Pittsburgh, 6.75c; Granite City, 7.20c. Transformer 72, 7.25-8.25c; 65, 7.95-9.20c; 58, 8.65-9.90c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.96c; eastern Mich., del., 3.03c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.55c-4.05c; Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.71c; eastern Mich., 3.78c; Worcester, base, 3.75c-4.45c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c; over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., per base box of 100 lb, 1.25 lb coating $6.60, 1.50 lb coating $6.80; Granite City, Birmingham, Sparrows Point, 1.25 lb coating $6.70, 1.50 lb coating $6.90.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., per base box of 100 lb, 0.25 lb tin, $5.80; 0.50 lb tin, $6.00; 0.75 lb tin $6.20; Granite City, Birmingham, Sparrows Point, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, Warren, O., per base box of 100 lb. 0.55 to 0.70 lb tin, $5.20; 0.75 to 0.95 lb tin, $5.10; 100 to 128 lb tin, $5.20.

Hollowware Enameling Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage, 4.75c per lb; Granite City, Birmingham, Sparrows Point, 4.85c per lb.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.90; Granite City, Birmingham, Sparrows Point, $6.00.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, (base, del.), 3.125c; Det., del., 3.21c; New York, del., 3.322c; Phila., del., 3.19c; Boston, del., 3.423c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.693c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 4.75c, basing points.)

Floor Plates: Pittsburgh, Chicago, Cleveland, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c. Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling; No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.088c; Phila., del., 2.968c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41-3.474c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.543c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads

Bright, basic or bessemer..... *$3.55-4.00
Basic MB Spring (except Birm.).. **$4.95
Upholstery Spring (except Birm.) †$4.60

Wire Products to Trade in carloads
Wire, Merchant Quality
Annealed (6 to 8 base) ..... ††$4.20
Galvanized (6 to 8 base) ..... ††$4.65

(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails

Standard, cement-coated, galvanized.. ‡94
Staples, polished and galvanized..... ‡‡94
Woven fence, 15 gage and heavier.... $100
Barbed wire, 80-rod spool..... §§113
Fence Posts (with clamps)..... 107
Bale ties, single loop..... §99

* Worcester, $3.65, Duluth, $3.60, base, San Francisco (base, del.), $4.56, bright basic only.

** Worcester, $5.05; Duluth & Trenton, N.J., $5.20 (bright only); San Francisco (base del.) $5.9845.

† Worcester $4.70, Duluth and Trenton, N. J., $4.85, base. San Francisco (base, del.) $5.6345 black upholstery.

†† Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed, $4.65, galvanized. San Francisco (base, del.) $5.21, annealed; $5.66 galvanized.

‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100; Cleveland 97; San Francisco (base, del.) 115.

‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100; San Francisco (base del.) 115.

§ San Francisco (base del.) 123.

§§ San Francisco (base del.) 133.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $60-$65 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.65 per 100 lb, fob mill; $3.40 base, Seattle; $3.20, base, Pittsburg, Calif. Splice bars $3.85 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld				
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½	36½
¼	44½	21½	1¼	53	37
⅜	41	17	1½	53½	37½
½	47	29½	2	54	38
¾	50	33½	2½ & 3	54½	38½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½-3	48½	32	47	30½	46½	30
3½-6	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½
¼	43½	1¼	52
⅜	40	1½	52½
½	46	2	53
¾	49	2½ & 3	53½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	47½	46	45½
3½-6	49½	48	47½
8	55½	50	49½
10	55	49½	49
12	54	48½	48

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D.		Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1"...	13	....	$12.46	$11.51	$11.51
1¼"...	13	....	14.76	11.48	13.64
1½"...	13	$14.00	16.47	12.69	15.22
1¾"...	13	15.92	18.74	14.43	17.31
2"...	13	17.84	20.99	16.17	19.39
2¼"...	13	19.88	23.40	18.02	21.62
2¼"...	12	21.90	25.77	19.86	23.80
2½"...	12	23.99	28.21	21.75	26.06
2¾"...	12	25.42	29.90	23.05	27.63
3"...	12	26.68	31.40	24.18	29.00
3¼"...	11	31.06	36.55	28.16	33.77
3½"...	11	33.35	39.26	30.23	36.27
4"...	10	41.40	48.70	37.53	44.99
4½"...	9	54.87	64.58	....	....
5"...	9	63.52	74.74	....	....
6"...	7	97.51	114.73	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅞ and ⅝ x 6-in. and shorter	46 off
⅝-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
7/16-in. and smaller	46 off	....
½-in. and smaller	....	44 off
½-in.-1-in.	44 off	....
⅝-in.-1-in.	....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ⅛-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	5.80c
7/16-in. and under	55 off
Lebanon, Pa.	.55 off plus 15c per cwt

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50	51.00	40.50	51.00
310....	53.50	56.50	57.50	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
408....	23.50	27.00	32.00	23.00	29.50
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	28.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442....	24.50	28.00	35.50	26.00	35.00
443....	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
†501...	9.00	13.00	17.50	13.00	18.50
†502...	10.00	14.50	18.50	14.50	19.50
‡STAINLESS CLAD STEEL (20%)					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

† Low chromium. ‡ Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.208	42.708	43.208	43.708
Brooklyn, N. Y., del.	....	44.10	44.60	....
Philadelphia, del.	42.004	42.504	43.004	43.504
Birmingham, base	35.88†	36.38†	....	....
Cincinnati, del.	....	40.74	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	47.776	47.776	48.276	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.08	40.58	41.08	41.58
Muskegon, Mich., del.	....	43.60	44.10	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.50	41.00	41.50	42.00
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base		45.00	45.50	....
Granite City, Ill., base	39.50	40.00	40.50	....
St. Louis, del.	40.25	40.75	41.25	....
‡Neville Island, Pa., base	39.00	39.50	39.50	40.00
Pittsburgh, del., N.&S. Sides	39.996	40.496	40.496	40.996
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Sharpsville, Pa., base	39.00	39.50	39.50	40.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	39.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati, del.	42.70	43.20	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.57	43.07	43.07	43.57

† Republic Steel Corp. quotes $3 a ton higher at Birmingham, effective Jan. 1, 1948; Republic quotes $5.50 higher for No. 2 foundry and malleable and $5.00 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended Feb. 29.

‡ To Neville Island base add: 79.2c for McKees Rocks, Pa., $1.212 Lawrenceville, Homestead, McKeesport, Monaco; $1.788 Oakmont; $1.596 Verona; $1.788 Brackenridge; 99.6c to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$47.50
6.51-7.00.. $48.75 9.01- 9.50.. 55.00
7.01-7.50.. 50.00 9.51-10.00.. 56.25
7.51-8.00.. 51.25 10.01-10.50.. 57.50
8.01-8.50.. 52.50 10.51-11.00.. 58.75
8.51-9.00.. 53.75 11.01-11.50.. 60.00

Fob Jackson, O., per gross ton; Buffalo base $3.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $77.50, Jackson, O.; $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$55.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $39.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.592, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace..$12.00-$13.00
Connellsville, foundry.. 14.00- 15.75
New River, foundry... 12.50
Wise county, foundry.. 11.15
Wise county, furnace.. 10.65

Oven Foundry Coke

Kearney, N. J., ovens. $18.75
Chicago, outside del.. 18.00
Chicago, del. 19.25
Terre Haute, ovens.... 18.50
Milwaukee, ovens 18.75
New England, del. 19.60
Birmingham, del. 15.76
Indianapolis, ovens ... 18.50
Cincinnati, del. 18.95
Ironton, O., ovens 16.75
Erie, Pa., del. 19.45
Painesville, O., ovens.. 18.10
Cleveland, del. 19.60
Buffalo, del. 20.15
Detroit, del. 19.00
Philadelphia, ovens ... 17.75
Swedeland, Pa., ovens. 17.75
Portsmouth, O., ovens. 17.00

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol ..... 21.00†
Toluol, two degrees 28.00
Industrial xylol 28.00
Solvent naphtha 28.00

Per pound fob works

Phenol (car lots, returnable drums) 12.50
Do., less than carlots 13.25
Do., tank cars 11.50

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use" 11.00

Per ton, bulk, fob plants

Sulphate of ammonia $40.00

† Freight allowed up to 2 cents

Refractories

Net Prices

Per 1000, fob shipping point

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $92.00

High Heat Duty

Pa., Ill., Md., Mo., Ky. ... 73.00
Ala., Ga. 73.00
N. J. 78.00

Intermediate Heat Duty

Ohio 67.00
Pa., Ill., Md., Mo., Ky. 67.00
Ala., Ga. 59.00
N. J. 70.00

Low-Heat Duty

Pa., Md., Ohio 59.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press 50.00
Wire Cut 48.00

Malleable Bung Brick

All bases $3.00

Silica Brick

Pennsylvania 73.00
Joliet, E. Chicago 82.00
Birmingham, Ala. 73.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick 64.00
Chem. bonded chrome 64.00
Magnesite brick 86.00
Chem. bonded magnesite ... 75.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk 27.00
Single bags 31.50

Dolomite

Domestic, dead-burned, bulk, net tons, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer $5.95
Old range nonbessemer 5.80
Mesabi bessemer 5.70
Mesabi nonbessemer 5.55
High phosphorus 5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic, 56.62% contract 15.20

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.... Nom.
Swedish basic, 60 to 68%. 13.50
Spanish, No. African basic, 50 to 60% ..... Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom. 5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid ..... $26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 65.00-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African
48% 2.8:1 ..... $37.50
48% 3:1 ..... 39.00
48% no ratio 31.00

South African (Transvaal)
44% no ratio .....$25.50-$26.00
45% no ratio 26.50
48% no ratio 28.50
50% no ratio 29.50

Brazilian—nominal
44% to 2.5:1 lump $33.65

Rhodesian
45% no ratio .....$27-$27.50
48% no ratio 30.00
48% 3:1 lump 39.00

Domestic (seller's nearest rail)
48% 3:1 ..... $39.00

Molybdenum

Sulphide conc., lb., Mo. cont., Mines $0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheet, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	6.00	...	...	...	...	6.00	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30†	5.30†	5.30	...	...	...	...	...
Shapes, structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy (**4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city)	5.03	6.09[4]	5.79[4]	6.23[4]	7.58[4]	5.61	6.87	5.04	5.88	7.64	4.91	5.18	6.86
New York (city)	4.96	6.16	5.86	6.16	7.51	5.59	...	5.06	5.63	7.23	4.80	5.11	6.78
New York (country)	4.81	6.01	5.71	6.01	7.36	5.44	...	4.91	...	...	4.65	4.96	6.63
Philadelphia (city)	4.70	6.32	5.92	5.90	7.25	5.32	5.72	4.87	5.75	8.77	4.57	4.85	6.47
Philadelphia (country)	4.55	6.18	5.78	5.75	7.10	5.17	5.57	4.73	...	...	4.47	4.71	6.32
Baltimore (city)	4.32†	5.95	5.65	5.72	7.07	4.80	...	4.85	5.71	...	4.71	4.77	6.30
Baltimore (country)	4.17†	5.80	5.50	5.50	6.85	4.65	...	4.70	...	...	4.56	4.62	6.15
Washington (city)	4.81	...	...	...	...	5.08	...	5.14	5.79[12]	...	4.98	5.03	6.60
Washington (country)	4.71	...	...	...	...	4.98	...	5.04	...	...	4.88	4.93	6.50
Norfolk, Va.	4.90	...	...	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis, Tenn. (city)	4.82[20]§§	5.87[20]†	...	6.37	...	5.02[20]	...	4.97[20]	5.87	...	4.97[20]	5.17[20]	6.87[20]
Memphis, Tenn. (country)	4.72[20]§§	5.77[20]†	...	6.27	...	4.92[20]	...	4.87[20]	5.77	...	4.87[20]	5.07[20]	6.77[20]
Buffalo (city)	4.45	...	5.20[8]	6.05	...	5.25	5.65	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (country)	4.30	...	5.05[8]	5.50	...	4.70	5.50	4.25	4.95	6.85	4.25	4.45	5.75
Pittsburgh (city)	4.25§§	...	5.10[8]†	5.65	6.90	4.35	5.35	4.40	5.10	6.85	4.40	4.60	5.90
Pittsburgh (country)	4.10§§	...	4.95[8]†	5.50	6.75	4.20	5.20	4.25	4.95	6.85	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[8]	5.20[8]	5.81	7.06	4.55	5.35	4.40	5.10	7.16	4.70	4.60	5.90
Cleveland (country)	4.30	5.35[8]	5.05[8]	...	...	...	5.20	4.25	4.95	...	...	4.45	5.75
Cincinnati	4.56	...	5.22	5.77	...	4.77	...	4.78	5.49	...	4.82	4.98	6.47
Detroit	4.55	...	5.30	...	...	4.72	5.63	4.50	5.22	7.10	4.77	4.88	6.28
Indianapolis	4.55	5.32[8]	...	5.87	7.12	4.65	5.90	4.70‡‡	5.40	8.85	4.70	4.90	6.35
Chicago (city)	4.45	5.50[8]	5.20[8]	5.65	6.90	4.35	5.45	4.40	5.10	6.85[9]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[8]	5.05[8]	5.50	6.75	4.20	5.30	4.25	4.95	6.85[9]	4.25	4.45	5.90
Milwaukee	4.658	5.708[8]	5.408[8]	5.858	7.108	4.558	5.658	4.608	5.308	7.208[9]	4.608	4.808	6.258
St. Louis	4.78	5.83[8]	5.53[8]	6.02	7.27	4.68	5.82	4.73	5.47[12]	...	4.73	4.93	6.38
Birmingham (city)	4.45[20]§§	...	...	5.65	...	4.45[20]	...	4.40[20]	5.93[22]	...	4.40	4.65	6.86
Birmingham (country)	4.30[20]§§	...	...	5.50	...	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
New Orleans	4.98[20]**	...	6.29[18]	...	...	5.18[20]	...	5.13[20]††	6.29[11]	...	5.03[20]††	5.33[20]	7.29[20]
Omaha, Nebr.	5.462	...	...	6.712	8.012	5.362	...	5.412	6.112	7.562	5.412	5.612	7.062
Houston, Tex.	5.75	...	...	7.36	8.10	6.00	...	5.35	7.00[12]	...	5.85	5.85	6.50
Los Angeles (city)	5.75	7.75[8]	7.45[8]	7.40	8.80	6.05	8.70	5.50	7.35[22]	9.35[10]	5.35	5.55	7.65
Los Angeles (country)	5.60	7.60[8]	7.30[8]	7.25	8.65	5.90	8.55	5.35	7.20[3]	9.20[10]	5.20	5.40	7.50
San Francisco	5.20[21]	6.65[8]	...	6.85[8]	7.75[8]	5.75[21]	8.70[18]	5.05[21]	7.00[12]	9.35	5.20[21]	5.30[23]	7.10[23]
Seattle, Tacoma, Wash.	5.30[17]§§	...	7.10[8]‡	6.95	...	5.60[17]	...	5.45[17]	7.45[19]	8.50[12]	5.25[17]	5.55[17]	7.65[17]
Portland, Oreg.	5.30[17]§§	...	7.10[8]‡	6.70	...	5.60[17]	...	5.45[17]	7.45[19]	...	5.25[17]	5.45[17]	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [2]—1500 lb and over; [3]—1000 to 4999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [18]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. Special Grade: (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%; Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si, carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 3c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si, carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb of briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c, c.l. packed 6.05c, ton lot 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.;Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c fer l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed, Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, 100 lb or more. 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western, add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.. Western, add 0.3c for c.l. and 3.05c for l.c.l Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10,75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: 17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo. fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Nonferrous Metal Supplies Continue Tight

Consumers of copper, lead and zinc still press for prompt and March deliveries. Brass ingot eases

NEW YORK — Nonferrous metal users have found no relief so far this year from the tight supply situation existing in most markets. Undertone of the brass and bronze ingot market is easier, however, reflecting the downtrend in red metal scrap prices.

COPPER — Consumers are still seeking substantial tonnages for March delivery but have been unable to satisfy their needs due to the sold-out position of leading producers. Electrolytic copper held firm last week on basis of 21.50c, Connecticut Valley, and 21.50c to 21.87½c, fas New York.

Actual consumption of copper by fabricators increased 17,179 tons in January to 127,227 tons, a new high since January, 1947, when consumption amounted to 138,328 tons. Deliveries of refined copper by producers to fabricators increased about 5400 tons to 118,855 tons, indicating an excess of 8372 tons in consumption over receipts. Total stocks of refined copper at fabricators' plants declined 8672 tons during January to 414,760 tons while unfilled orders declined 4800 tons to 333,460 tons, the smallest order backlog since 1944. Deficiency in the consumers' sales position rose sharply in January to 121,138 tons from 104,922 at the end of December.

BRASS, BRONZE INGOTS—Price range on brass and bronze ingots widened further last week when one leading producer announced another reduction of 1/4-cent a pound on certain grades. The lower level of quoted ranges were reduced by this action to 18.50c for ingot No. 115, 18.00c for No. 120, 17.50c for No. 123, 21.25c for No. 245, 14.50c for No. 405 (No. 1), and 17.25c for manganese bronze ingot No. 421.

LEAD—Available supplies remain well below demand, forcing leading sellers to continue to allocate their offerings. Demand continues heavy for both prompt and March metal at 14.80c to 14.85c, St. Louis. St. Joseph Lead Co. has discontinued quoting on a New York basis. As previously stated, this company now guarantees the cost of lead to its eastern customers not to exceed the New York price plus $3 to $5 per ton.

ZINC—Demand continues to exceed supplies by a wide margin, sustaining the sellers' market. Prices held firm last week at 12.00c, East St. Louis. Stocks of zinc in all forms held by the Office of Metals Reserve as of Jan. 31 totaled 95,451 tons, a decline of 5316 tons for the month. While grade A stocks increased to 16,031 tons from 12,140 tons at the end of December, prime western stocks dropped 3601 tons to 13,706 tons. Zinc content of ores and concentrates declined to 65,714 tons from 71,320 tons. It is estimated that smelter-owned stocks at the end of January totaled only about 25,000 tons, the lowest level recorded in a number of years.

ANTIMONY — OMR stocks of antimony as of Jan. 31 amounted to 6504 tons, a decline of 302 tons from Dec. 31. Of the Jan. 31 total, 6244 tons were metal and 260 tons represented content in ore.

TIN — Legislation to extend controls over tin and antimony through Mar. 31, 1948, was passed by the House of Representatives last week. Prices held at 94.00c, New York, for Straits.

ALUMINUM — Due to the extensive substitution of aluminum for steel, aggravating an already tight supply situation in the former, a gray market is reported developing rapidly in some large consuming centers. Operations in this market are handicapped, however, by the fact that producers are allocating their production to regular customers on the basis of 1947 shipments. New customers are supplied only after careful investigation of needs.

NONFERROUS METAL PRICES

Copper: Electrolytic, carloads 21.50c, delivered Conn. Lake, 21.62½c del. Conn. Dealers may add ⅛c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 500-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 18.50-19.25c; 88-10-2 (No. 215) 28.00c; 80-10-10 (No. 305) 24.25c; No. 1 yellow (No. 405) 14.50-16.00c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, E. St. Louis; high grade 13.00c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 16.50-16.75; No. 12 foundry alloy (No. 2 grade) 16.25-16.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 16.50-17.00c; grade 2 (92-95%) 16.00-16.50c; grade 3 (90-92%) 15.75-16.00c; grade 4 (85-90%) 15.25-15.50c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c, fob Freeport, Tex.; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb. 42.00-46.00c; 100 to 4000 lb, 35.00-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (including Straits), 94.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 93.85c; Grade C, 99.65-99.79% incl. 93.50c; 99.00-99.64% 93.50c and 98.00-98.99%, 92.60c for tin content.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 33.75c lb; 25 lb pigs produced from electrolytic cathodes 35.25c lb; shot produced from electrolytic cathodes 36.25c lb; "F" nickel shots or ingots for addition to cast iron 34.25c lb. Prices include import duty.

Mercury: Open market, spot, New York, $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, N. Y., 74.62½c, per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $85-$95 per troy ounce.

Rolled, Drawn, Extruded Products

Copper and brass product prices are fob mill, with freight prepaid on 200 lb or more.

Sheet: Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c; best quality 30.78c.

Seamless Tubing: Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c; best quality brass 33.50c.

Wire: Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

Copper Wire: Bare, soft, fob eastern mills, carlots 26.80c, less carlots 27.30c; weatherproof, fob eastern mills, carlots 27.35c, less carlots 27.85c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu; 50 lb bags, 25.00c fob Cleveland.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c, 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 23.50c; 275-lb bbls. 21.50c.

Tin Anodes: Bar, 1000 lb and over 110.00c; 500 to 1000 lb, 110.50c; 200 to 5000 lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 1000 lb. 112.75c; 200 to 500 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., price on application.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices for less than 15,000 lb fob shipping point. Add ⅝c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 5%	16.500	16.250	8.250
Phos. bronze, A. B.	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.50, No. 2 copper 16.50, light copper 15.50, composition red brass nom. 14.00, auto radiators 10.75, heavy yellow brass 10.25, brass pipe 11.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.00, No. 2 copper 17.00, light copper, 16.00, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 15.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.00-16.50, No. 2 15.00-15.50, light copper 14.00-14.25, No. 1 composition red brass 11.50-12.00, No. 1 composition turnings 11.00-11.50, mixed brass turnings 7.00-7.25, new brass clippings 12.50-13.00, No. 1 brass rod turnings 10.00-10.50, light brass 6.00-6.25, heavy yellow brass 8.25-8.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 9.25-9.50, cocks and faucets 9.25-9.50, brass pipe 9.00-9.25.

Lead: Heavy 12.00-12.50, battery plates 7.25-7.50, linotype and stereotype 14.50-15.00, electrotype 12.00-12.50, mixed babbitt 13.50-14.00, solder joints 16.50-17.00.

Zinc: Old zinc 5.50-5.75; new die cast scrap 4.75-5.25, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 60.00-62.00, block tin pipe 77.00-78.00, auto babbitt 45.00-47.00, No. 1 babbitt 45.00-48.00, siphon tops 45.00-47.00.

Aluminum: Clippings 2S 9.00-9.50, old sheets 7.00-7.50, crankcases 7.00-7.50, borings and turnings 2.50-3.00, pistons, free of struts, 6.00-6.50.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
January Average:	21.500	14.825	11.056	94.000	15.000	33.000	33.750	74.625
Feb. 2-26	21.50	14.80-14.85	12.00	94.00	15.00	33.00	33.75	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 and 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.00-36.50
Mixed Borings, Turnings	36.00-36.50
Short Shovel Turnings.	37.00-37.50
Cast Iron Borings	37.00-37.50
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.00
Heavy Turnings	40.00-40.50

Cast Iron Grades

No. 1 Cupola	61.00-62.00
Charging Box Cast	45.00-47.00
Heavy Breakable Cast.	46.00-47.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	52.00-53.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-57.00
Rails, Random Lengths	53.00-54.00
Rails, 3 ft and under	57.50-58.50
Rails, 18 in. and under	58.50-59.50
Railroad Specialties	54.00-55.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

*Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

*Plus applicable freight springboard.

Cast Iron Grades

No. 1 Cupola	70.00-72.00
Charging Box Cast	60.00-62.00
Stove Plate	60.00-62.00
Heavy Breakable Cast.	56.00-58.00
Unstripped Motor Blocks	60.00-62.00
Malleable	75.00-80.00
Brake Shoes	54.00-55.00
Clean Auto Cast	70.00-72.00
No. 1 Wheels	60.00-62.00
Burnt Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	75.00-80.00
Rails, Rerolling	58.00-60.00
Rails, Random Lengths	59.00-60.00
Rails, 3 ft and under	63.00-65.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	56.00-57.00
Angles, Splice Bars	59.00-60.00

*Plus applicable freight spring board.

VALLEY

No. 1 Heavy Melt. Steel	40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	45.00-48.50

*Plus applicable freight springboard.

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

*Plus applicable freight spring board.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings.	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
No. 1 Bundles	39.50
No. 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings.	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast.	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings Turnings	29.00-29.50
Short Shovel Turnings.	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	60.00-62.00
Heavy Breakable Cast.	50.00-52.00
Clean Auto Cast	62.00-65.00

BUFFALO

No. 1 Heavy Melt. Steel	$43.00-45.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.75
Mixed Borings, Turnings	34.75-35.75
Cast Iron Borings	36.50-37.00
Short Shovel Turnings.	36.75-37.25
Low Phos.	45.00-46.00

Cast Iron Grades

No. 1 Cupola	62.00-64.00
Mixed Cupola	60.00-62.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	54.00-55.00
Railroad Specialties	55.00-56.00

PHILADELPHIA

No. 1 Hvy. Melt. Steel	$41.50
No. 2 Hvy. Melt. Steel	39.00
No. 1 Busheling	39.00
No. 1, No. 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings.	36.00
Bar Crop and Plate	46.50
Punchings & Plate Scrap	46.50
Cut Structurals	46.50
Elec. Furnace Bundles.	44.50-45.00
Heavy Turnings	43.00-44.00
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-64.00
No. 1 Machinery Cast.	65.00-66.00
Charging Box Cast	59.00-60.00
Heavy Breakable Cast.	59.00-60.00
Unstripped Motor Blocks	52.00-53.00
Malleable	74.00-76.00
Clean Auto Cast	63.00-64.00
No. 1 Wheels	64.00-65.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.03
No. 2 Heavy Melt. Steel	34.03
No. 1 Busheling	34.03
Nos. 1 & 2 Bundles	34.03
No. 3 Bundles	32.03
Machine Shop Turnings	29.00-30.00
Mixed Borings, Turnings	29.00-30.00
Short Shovel Turnings.	30.50-31.00
Punchings & Plate Scrap	40.00
Cut Structurals	40.00
Elec. Furnace Bundles.	40.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-58.00
Charging Box Cast	55.00-58.00
Heavy Breakable	55.00-58.00
Unstripped Motor Blocks	52.00-54.00
Malleable	65.00-68.00

BOSTON

(Fob shipping point)

No.1 Heavy Melt. Steel	$31.40-31.90
No. 2 Heavy Melt. Steel	31.40-31.90
No. 1 Bundles	31.40-31.90
No. 1 Busheling	31.40-31.90
Machine Shop Turnings	26.90
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings.	28.90
Bar Crops and Plate	37.00
Punchings & Plate Scrap	37.00
Chemical Borings	34.00-35.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast.	58.00-60.00
Stove Plate	55.00-57.00
Unstripped Motor Blocks	45.00-46.00
Clean Auto Cast	53.00-55.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.00-39.50
No. 2 Heavy Melt. Steel	38.00-39.50
Nos. 1 & 2 Bundles	38.00-39.50
No. 3 Bundles	36.00-37.50
Machine Shop Turnings	33.00-34.50
Mixed Borings, Turnings	33.00-34.50
Short Shovel Turnings.	35.00-36.50
Cast Iron Borings	34.00-35.50
Bar Crops and Plate	45.50-47.00
Punchings	49.00-50.50
Elec. Furnace Bundles.	39.00-40.50
Heavy Turnings	37.50-39.00
Cut Structurals	43.00-44.50

Cast Iron Grades

No. 1 Cupola Cast	65.00-67.00
Clean Auto Cast	62.00-65.00
No. 1 Wheels	53.00-56.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
Malleable	70.00-71.00
Rails, Rerolling	49.50-50.00
Rails, Random Lengths	46.00-47.00
Rails, 3 ft and under.	55.00-56.00
Rails, 18 in. and under	57.00-58.00
Railroad Specialties	49.00-50.00
Angles, Splice Bars	51.00-52.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.50-40.50
No. 2 Heavy Melt. Steel	37.50-38.50
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings.	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	60.00-65.00
Mixed Cast	60.00-62.00
Heavy Breaklable Cast.	53.00-55.00
Brake Shoes	54.00-55.00
Clean Auto Cast	64.00-66.00
Burnt Cast	58.00-59.00

Railroad Scrap

R.R. Mealleable	65.00-70.00
Rails, Rerolling	54.00-55.00
Rails, Random Lengths	52.00-53.00
Rails, 3 ft and under	57.00-60.00
Uncut Tires	46.00-47.00
Angles, Splice Bars	46.00-48.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	51.00
Stove Plate	43.00
No. 1 Wheels	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	45.00
Axles, Steel	39.00
Rails, Rerolling	52.00
Rails, Random Length.	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	20.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	24.00
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	22.00
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	24.50
Cut Structurals	24.50

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast.	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
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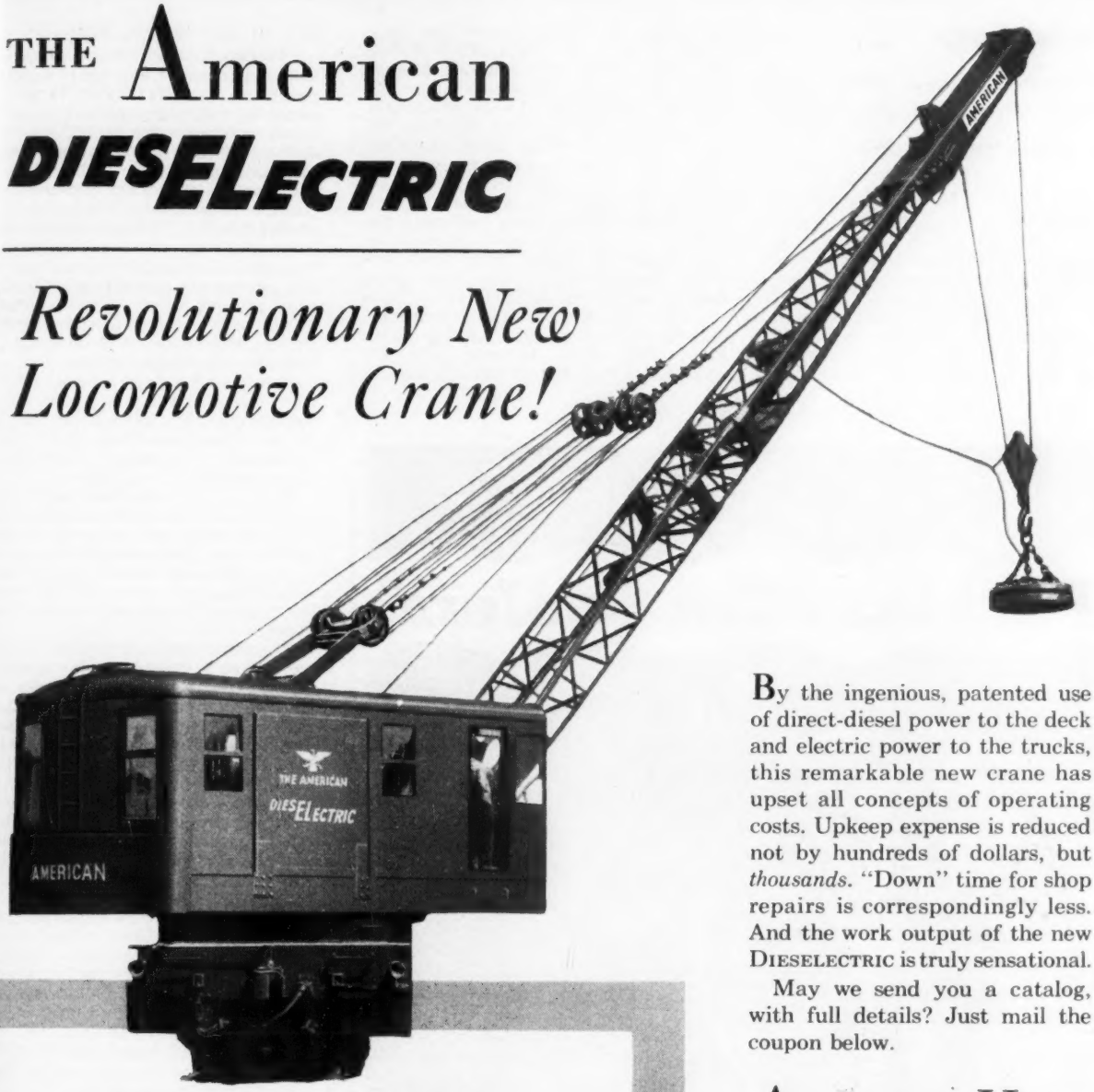

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Sheets, Strip . . .

Integrated firms have not raised sheet and strip prices as predicted by some

Sheet Prices, Page 150

Pittsburgh — Integrated steel producers have not advanced prices on sheet and strip items as originally predicted by some consumers on the basis of advances in semifinished steel. Leading steel interests contend that the advance in semifinished steel prices was made to more accurately reflect the raw material production costs and to bring prices for these items more in line with finished steel products. However, some finished steel price action is indicated on the part of nonintegrated steel producers, dependent on integrated interests for their supply of billets, slabs, etc. Continued efforts on part of metalworking companies to supplement their strip and sheet supply by means of ingot conversion deals clearly indicates the general acute shortage expected in the supply of these items well into 1949. Some sheet sellers note occasional easing in demand from such sources as producers of heavy trucks, and some predict slight falling off in sheet and strip requirements for household appliances during second half of the current year.

Cleveland — Further tightening of the carbon sheet and strip supply appears in prospect, due largely because of voluntary allocation of steel to the railroad car building program and to effects of recent shortage of industrial gas. Also to be felt will be the month's shutdown of Sharon Steel Corp.'s 24-inch continuous strip mill at Sharon, Pa., for installation of new roughing rolls and heating furnaces. For the railroad carbuilding program, one producer's second quarter allocation of flat-rolled carbon products, principally hot-rolled and galvanized sheets, will be two and one-half times that for the first quarter.

Inquiries for new sources of sheets were being made here last week by consumers who have been customers of the Chapman Price Steel Co., Indianapolis, recently purchased by Kaiser-Frazer Co., Detroit.

Some buyers who find they temporarily do not need their allotments of steel are reluctant to forego ordering, although at least one leading producer is emphasizing that customers will not jeopardize their future position by making temporary reductions in orders.

Republic Steel Corp. district offices have been given their May quotas for flat-rolled carbon products. As in April, the company's Cleveland district mill is taking no orders for electrogalvanized sheets for May but will use that month to help catch up with orders booked in earlier months. However, the Gadsden, Ala., district which skipped order-taking in April, will take May orders for galvanized sheets, and the Canton, O., district which for the first time since the second quarter of 1947 set up quotas for April on galvanized and galvannealed sheets will continue to take orders for those products for May.

To permit repairs to a coiler, Republic Steel Corp.'s hot strip and sheet mill here worked only 15 eight-hour turns last week, but will return to its usual 18 turns this week.

New York — Indicative of the extent to which operations have been hampered by weather conditions, one large sheet producer estimates that arrearages in cold-finished material amount to about two months, having little new tonnage to offer for shipment before June. Some units since early December have been unable, due mainly to the gas shortage, to get average production up to more than 50 per cent. Arrearages of most producers at the end of this quarter will average five to six weeks. On this basis alone, consumers will be allotted less new tonnage in second quarter, although they will receive more overall tonnage. Certain producers, who heretofore had established quotas on a quarterly basis, have established them on a monthly basis and have opened May books.

Arrearages are particularly heavy in cold-finished and galvanized sheets; the situation in hot-finished is not quite so bad, although it is still highly stringent. Conditions in enameling stock are also very tight. Electrical sheets are in better balance, due in part to somewhat larger facilities and to less pressure from consumers. However, most producers still have substantial backlogs. The situation in stainless steel is a little tighter, certain producers now offering shipments in 13

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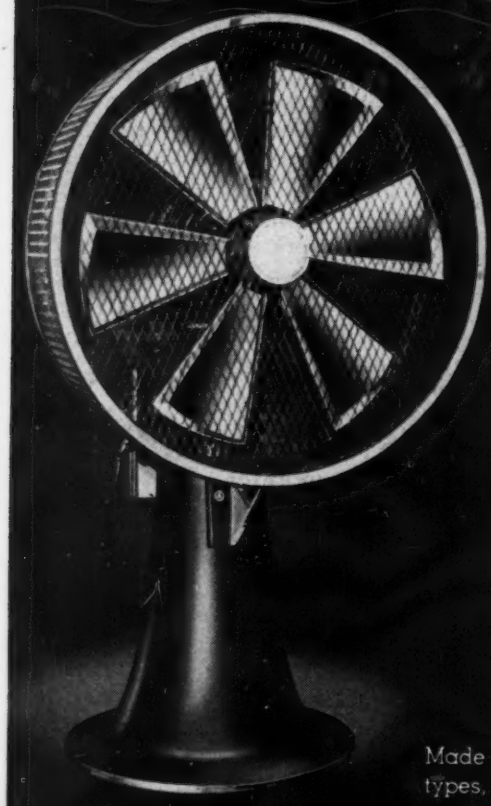

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to 14 weeks as compared with 10 to 11 early in the year. This is ascribed also in part to adverse operating conditions due chiefly to shortage of gas.

Less steel is being sold here in the open or so-called gray market, as less steel is reaching the market. Most transactions are in sheets and strip, with sales reported at anywhere from $200 to $250 a ton. Some light gage plates have been recently reported sold at $162.

Boston — Among users of flat-rolled steel, those who lost regular sources of supply through withdrawals of producers from this territory are the hardest hit. Most of them are unable to place full requirements with other producers and are shopping for fill-in needs in the gray market. Locating wanted grades and sizes is difficult at any price. Sheet and strip carryovers into the second quarter will be substantial, although a few mills are making some progress against arrearages. In carbon sheets, hot-rolled is notably scarce for second quarter with some mills having no tonnage of that grade to offer. Narrow hot strip supply has narrowed to the point one mill in the Pittsburgh district is the source of most tonnage available to nonintegrated cold-finishing mills.

Philadelphia — Sheets and strip continue to be in tightest supply of all major items. Consumers should receive over coming months more tonnage, although a substantial portion of it will be overdue material. Carryover at the start of the second quarter likely will be equivalent of five to six weeks' production. One leading seller indicates that his carryover of cold-finished sheets will be the equivalent of two months' full production, due primarily to shortage of pig iron and scrap and an insufficient supply of gas.

Cincinnati — Announced increases in prices of semifinished steel had no immediate effect at district sheet mills, as none is buying from outside sources and none is offering semifinished on the open market. Moreover, there is no change in sheets and strip. Because some rolling operations were curtailed by gas shortage recently, the carryover into second quarter will be greater than at the yearend and likely will result in downward adjustments in allotments.

Chicago — Sheet and strip demand is holding steady and strong. There are no cancellations and customers press for deliveries of tonnages due them under quotas. First easing in demand undoubtedly will manifest itself in diminishing interest in conversion tonnage. There is already a faint indication that such a situation may be developing. A few consumers who have not taken up conversion space allotted to them due to difficulty in acquiring semifinished steel for conversion, are seeking larger direct mill quotas. Some customers are becoming more cautious about scheduling conversion beyond the middle of second quarter.

Birmingham — Recent stock market fluctuations had no effect on steel demand. Current demand for sheets fails to indicate any easing in the exceedingly tight supply situation.

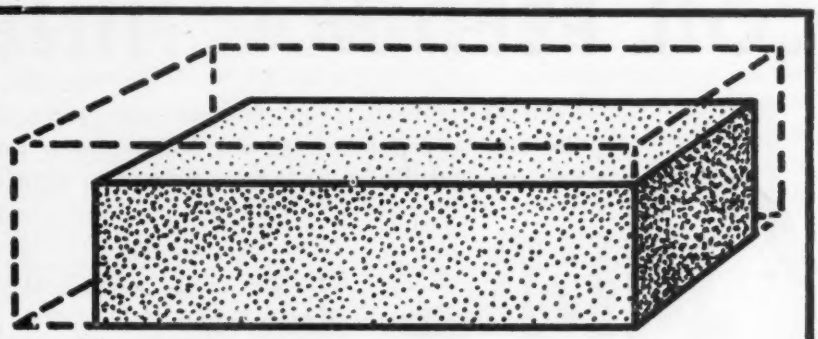
St. Louis—Sheet production currently is centered on roofing and tinplate, for which peak demand exists. Granite City Steel Co.'s second quarter books still remain closed, pending a rise from 50 per cent to capacity operations on its new cold reduction mill. Some lags have developed in auxiliary production lines. The firm's scrap shortage apparently is over and additional furnaces will be lighted as rolling capacity warrants.

Wire . . .

Wire Prices, Page 151

Pittsburgh — All producers of nails in this area have switched to the column basis of quoting, but there is no uniformity as to price. American Steel & Wire Co. is quoting standard, cement coated, and galvanized nails, polished and galvanized staples, at column 94 to dealers; Portsmouth Steel at column 108; and Pittsburgh Steel at column 114. Additional production emphasis on housing nails is expected over coming months to meet the sharply augmented housing requirements. Revision of present nail distribution pattern to relieve areas in critically short supply would only aggravate the tight supply situation already existing in other areas, some sellers say. Producers report some improvement in production schedules.

Birmingham — Wire products are extremely tight. The district's largest jobber reported "no nails" last week. That may not be literally true, but it does mean there are "no nails" if the demand for what few there are is considered. The same is true generally for sheets and wire fencing.



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Structural Shapes . . .

New extra card of Carnegie-Illinois raises prices an estimated $3.50 a ton

Structural Shape Prices, Page 151

Pittsburgh — Carnegie-Illinois Steel Corp. issued its new extra card on hot-rolled carbon structural shapes last week. The revisions are estimated to represent an average increase of $3.50 per ton. Upward adjustments in extras reported a week ago included also the following:

Splitting extras by rotary shear have been increased up to 20 cents for the size range of 30 to 200 pounds per foot of rolled section before splitting; for over 200 feet, prices are available only on application. Flame cutting extras have been increased 5 to 25 cents, and, as in case of splitting by rotary shear, not all the extras were advanced. A new schedule of extras for milling one or two ends has been set up with a minimum of $2 to $9 and maximum charges of $15 to $25 for the various ranges in depths of sections. For cambering of wide flange and standard beam sections 21 inches and over in depth which can be done at the mill, 25 cents per pound is charged with a minimum of $6 per piece. Formerly this charge was 10 cents per 100 pounds, with $3 minimum. Under the carbon heading in the chemical requirement extra section of the new card, the following has been inserted: "For carbon max 0.40 per cent or higher, a killed steel will be furnished and the appropriate extra shown under silicon will apply." The wordage under "Restricted Chemical Requirement Extras" has been revised particularly in respect to the reference to restricted phosphorus or sulphur contents. The size and section extras for H-beams have been advanced an additional 5 cents above the increase previously reported by the company. The new extras are on a cents per pound basis.

New York — Structural buying is slightly smaller, although considerable tonnage is still being figured and some of the larger fabricators are so far booked ahead they are turning down a portion of the business offered. Part of the present lull in buying is ascribed to the fact that on certain of the larger projects fabricated steel cannot be had in time to get construction completed before next winter. High costs are another factor, although builders are not quite as hesitant as they were a couple of weeks or so ago before commodity markets began to break. Structural bookings in January, according to American Institute of Steel Construction, amounted to 155,119 tons. This represents an increase of 48 per cent over the bookings for January, 1947, and 8 per cent over bookings for December.

Shipments during the month totaled 130,871 tons, with the backlog available for fabricating as of Jan. 31 amounting to 691,697, against 671,091 tons as of Dec. 31.

Boston — Deliveries by larger structural fabricating shops are extending less rapidly, although they are in June and July. Most smaller shops have

work through the summer. Bulk of structural inquiry is for earlier delivery and contracts are frequently placed on a delivery basis. Seasonal increase in inquiry is developing more slowly than usual, due in part to high costs. Mills' carryovers are from two to three weeks, reflecting improvement in schedules. Freight car building needs will continue to draw off substantial tonnages through 1948.

Chicago — A report that the voluntary allocation program now being set up by the government for a few preferred industries will require increased production of certain steel products to the detriment of structurals is denied by producers. The allocation program has not crystallized to the point where definite tonnages of any products can be arrived at. Only the freight car program has been defined and it does not differ greatly from the tonnage supplied in recent months. New inquiry for structural steel is light and awards do not aggregate substantial tonnage.

Seattle — Fabricators are revising their estimates in view of the rise in mill prices. Steel allocations for the second quarter continue below the needs of the industry in this area, being about the same as for the first quarter. Plants are content to take small jobs as the difficulty of obtaining materials deters them from bidding on large projects. Supplies are being spread as far as possible, in some instances substitutions being improvised such as welded plates for beams.

Alan Wood Steel Co. Revises Price Schedule

Philadelphia — Alan Wood Steel Co., Conshohocken, Pa., has revised quotations on semifinished, changing from a gross to a net ton basis, with the price on rerolling steel the same at $50 and the price on forging quality down $1 from $55 to $54, base. For export shipment, rerolling billets will be quoted $64.50 a net ton, compared with $68.38 a gross ton.

This producer, which has a limited capacity for rolling hot sheets, has advanced prices on this product to 4.20c, Sparrows Point equivalent. These changes are effective Mar. 1.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 152

Pittsburgh — Many foundries in this district were disappointed in learning that expected shipments of coke from Daingerfield, Tex., will not materialize. To offset the loss of 6500 tons of oven foundry coke shipped into this district monthly, from Domestic Coke Corp. ovens recently sold to Sharon Steel Corp., most foundries have been forced to rely to much greater extent on beehive coke. This situation is further reflected in the gradual increase in beehive foundry coke prices, with bulk of tonnage moving within price range of $14 to $15.75. An occasional small lot sale is reported as high as $16 to $17. Some oven foundry coke is coming into this district from Chicago and other points. However, the tonnage is relatively insignificant in relation to current requirements. Despite the coke shortage, pig iron remains the chief retarding production factor.

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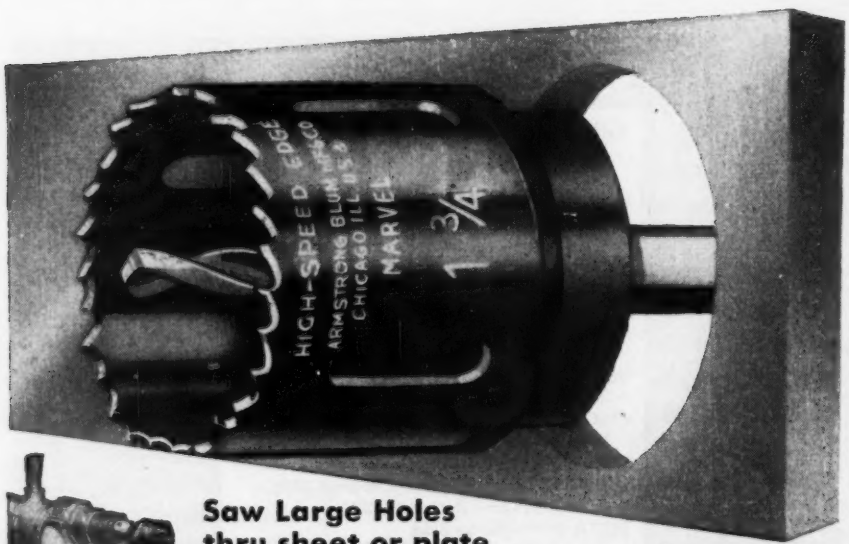

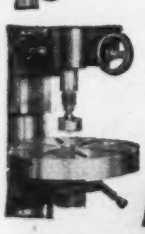

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Plates . . .

Plate Prices, Page 151

Plate carryovers expected to be heavy, with consequent cuts in second quarter quotas

Boston — Construction and engineering projects taking spot lots of plates are endangered by shortages. As a result of production losses, plate carryovers to the second quarter will be large, limiting allocations for that period. Weldment shops are drawing on inventories as deliveries lag while tank builders are pressed to maintain schedules. Reservations under voluntary distribution for the freight car building and other programs are somewhat heavier. Second quarter allotments cover this increase. Considerable rescheduling already has been forced on plate mills. Mills' overall output is now heavier and should be larger in the second quarter.

New York — Tank fabricators report increasingly heavy backlogs, in some cases seven months and beyond. This is ascribed not only to well sustained demand, but to difficulty in obtaining an adequate amount of steel. These fabricating oil tanks stand some chance of obtaining relief through the voluntary allocation program, once it becomes established. The oil industry likely will be the most favored under the program.

However, most tank makers fabricate considerable tonnage that is not subject to priority ratings. Hence, until the plate situation in general eases up substantially they will continue to be handicapped by insufficient tonnage.

One complication also is that on practically all public work escalator clauses are banned by the governmetal agencies. This means that tank makers have to give a firm price and with their backlogs so heavy this is a difficult thing to do. Moreover, as a result of the extended deliveries, tank makers are unable sometimes to offer shipments desired and lose out for that reason.

Most plate producers have been unable to reduce their arrearages, largely because of operating difficulties.

Philadelphia—Plate production continues to be adversely affected by shortage of scrap and pig iron, although there is some improvement in the receipt of scrap. It is difficult for producers to get caught up on arrearages, with a result that the carryover at the beginning of next quarter will be as heavy (if not heavier) than at the beginning of the current period.

Birmingham — Plates continue scarce. Warehouses complain they are unable to stock sufficient sheet steel of any variety to assure even small deliveries. It will probably be July before Republic Steel Corp.'s Gadsden tube mill is ready to produce. That is good news, at least momentarily to plate users.

Seattle — Plants are handicapped by the increasingly acute shortage of plates. Operations are about normal in orders involving small tonnages for tank and boiler work. No large projects are out for figures.

Steel Bars . . .

Bar Prices, Page 150

New York — Bar prices are unchanged but in general the situation is bullish, with strong consuming pressure adding to general market strength. Consumers of hot carbon bars report requirements well in excess of supply and look for this condition to continue for at least another quarter.

Actually, excepting those who may receive preference under the voluntary allocation plan, consumers probably will receive less in the way of new tonnage for the second quarter, although, considering that already due them and the prospects for better mill operating conditions, they likely will receive more overall tonnage.

Cold-drawn carbon bar sellers report improved demand. Delivery promises on small flats and special shapes are well extended, with some sellers sold ahead until late this year. Hot and cold-rolled alloy bars can still be had for shipment in six to seven weeks.

Boston — Most users of carbon bars, 1/2-inch to 2-inch, have better inventories. Forge shops, however, are still in need of bars in sizes under 1/2-inch to balance inventories. Commitments to distributors are curtailed to meet manufacturing consumer demand. Carbon bar carryovers will be substantial. Recent improved demand for alloys is holding. Industries covered by the voluntary allocation plan are expected to ask for more tonnage next quarter and in most cases, if this develops, any increase will be at the expense of other users. Screw machine products account for a good ratio of bar volume and there is little or no letdown in alloy and other grades used by antifriction bearing plants.

Philadelphia — Outlook in hot carbon bars shows few signs of easing. Actually, most consumers may be allotted less in the second quarter than they were promised at the beginning of this quarter. They may, in fact, receive less new tonnage than they are currently receiving, although much depends upon how soon the voluntary allocation program gets into full operation. They should, however, receive more overall tonnage, including arrearages, for bar production should be heavier. The situation in alloy bars is tightening, even though supply and demand still appear to be in fair balance.

Tin Plate . . .

Tin Plate Prices, Page 151

Pittsburgh — Output of tin mill products has been well sustained despite recent shortage of industrial gas. Indicated revision in container order M-81 to conserve pig tin has created many obstacles for producers in the establishing of second quarter product mix. In addition to shifts in container specifications from hot-dipped to electrolytic and from electrolytic to bonderized and canmaking quality black plate, some sellers expect a trend in specifications to the lower range of electrolytic coatings.

Chicago — Tin plate customers are complaining that second quarter quotas are inadequate, although little objection was voiced when they were

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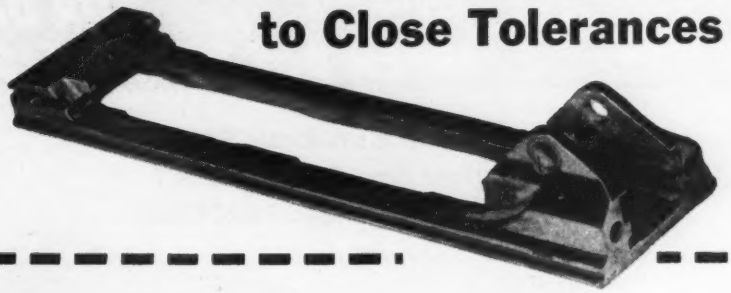

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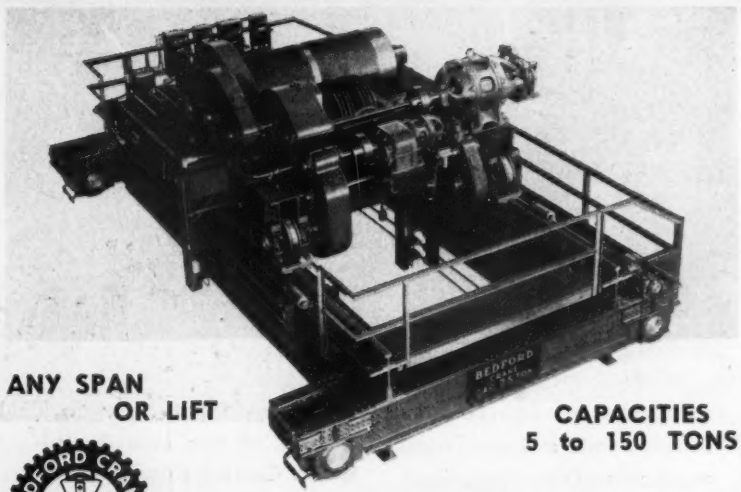

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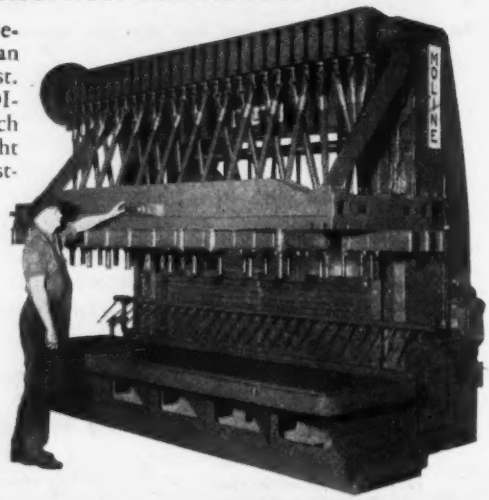

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announced. The inference is that demand for products made from tin plate has risen to the point where it cannot be satisfied unless quotas are raised. Under present conditions, makers see no way to provide relief.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 150

Pittsburgh — New inquiries have held up exceptionally well for this season of the year, with considerable tonnage involved for U. S. Engineers' projects, including lock No. 2 on the Monongahela river near Braddock, Pa. U. S. Engineers office already has purchased 5200 tons of sheet piling and 327 tons of bearing piles from Carnegie-Illinois Steel Corp. for this project. Unusually heavy demand for concrete bars also is indicated this spring for highway construction. Producers' production schedules this quarter were reduced up to 50 per cent on some mills, due to the industrial gas shortage, and will necessitate a revision in second-quarter production allotments.

Seattle — Rolling mill capacity is heavily taxed by the demand for construction materials. Volume of reinforcing bar orders in lots of less than 100 tons each is of major proportions, but several large projects loom for the near future.

Warehouse . . .

Warehouse Prices, Page 153

Pittsburgh — Warehouse steel interests revised structural steel extras in line with those recently put into effect by mills. Receipts from mills this quarter are 10 to 25 per cent below those recorded in the comparable period last quarter. However, some improvement in mill shipments is indicated through the remainder of the first quarter, reflecting easing in industrial gas shortages. Warehouse steel inventories on light gage sheets and strip continue nearly depleted, with many customers having to curtail production schedules as a result. Inventories of cold-finished bars and alloy steel items are adequate to meet current requirements, although mill deliveries on these items have been substantially extended in recent weeks.

Philadelphia — Warehouse prices are unchanged, although there will be revisions in tubular prices as a result of recent mill increases. It is requiring a little time to work these schedules out. Meanwhile business is increasingly active, possibly reaching a peak late in the spring.

Cleveland — In recognition of the naming of Cleveland by Jones & Laughlin Steel Corp. as a basing point for floor plate, several warehouses here have revised the prices downward for that product. Heretofore, Cleveland warehouses formulated floor plate prices on a Pittsburgh or Chicago base price plus freight from those points. Considering effects of recent curtailments of industrial gas to steel mills and the impact of the voluntary allocation of steel to the railroad carbuilding program, warehouses foresee a reduction in their receipts of tonnage from mills.

Chicago — Operating under overwhelming demand, warehouses have unbalanced stocks. For customers

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who depend upon distributors for small quantities of steel in emergencies and to bolster mill supplies, this situation is handicapping them. Products most sought after and hardest to get are flat rolled, bars, structurals and plates. Recently, alloys, particularly, cold drawn, have tightened appreciably.

Cincinnati—Warehouses with close mill connections have maintained February sales at a level close to that of recent months, part of the volume on wasters and rejects. Some jobbers, however, found replacement shipments sagging. Inventory position deteriorated during the month. The demand remains at peak.

Tubular Goods . . .

Tubular Goods Prices, Page 151

Boston — The natural gas industry is suggesting that it be included in allocations for pipe line expansion. One proposed line from Texas to Boston would bring natural gas to New England in volume. Meanwhile, utilities are asking for pipe tonnage far in excess of their prewar consumption but have slight prospect of filling their requirements. Second quarter pipe quotas are unchanged with distributors' stocks low. Tubing specialty makers are committed for the second quarter.

Seattle — Cast iron pipe market continues in the doldrums, interest lacking because of slow and uncertain deliveries, although the potential demand in this area is strong.

Pittsburgh — Pittsburgh Steel Co. raised pressure tubing 7 per cent on hot-rolled, and 5 per cent on cold drawn Feb. 20; cold drawn and hot-rolled mechanical tubing was advanced 5 per cent on same date. Company has not taken any price action as yet on casing, drill pipe and oil well tubing. Prior to recent price advances by other producers on these items, Pittsburgh Steel was quoting about 9 per cent higher.

U. S. Steel Export Co. Revises Price Schedule

New York — United States Steel Export Co., subsidiary of the United States Steel Corp., New York city, has announced the following base prices, effective Feb. 13, as applying to export shipment with export freight included to New York, Philadelphia or Baltimore. All prices are subject to adjustment to seller's price in effect at time of shipment from the mill; and all are net cash.

	Per Net Ton
Ingots, rerolling quality	$59.50
Ingots, forging quality	60.50
Tube Rounds	83.50
Billets, Blooms and Slabs	
Rerolling quality	59.50
Forging quality	68.50
	Per 100 Lb
Skelp	$3.68
	Discount
American Standard Pipe T. & C.	
Buttweld, 2½-in. & 3-in.	
Black	47.7
Galvanized	31.7
Seamless, 3½-in. to 6-in.	
Black	41.7
Galvanized	25.2
English Gas Tubes, T. & C.	
Buttweld, 2½-in. & 3-in.	
Black	47.0
Galvanized	34.0

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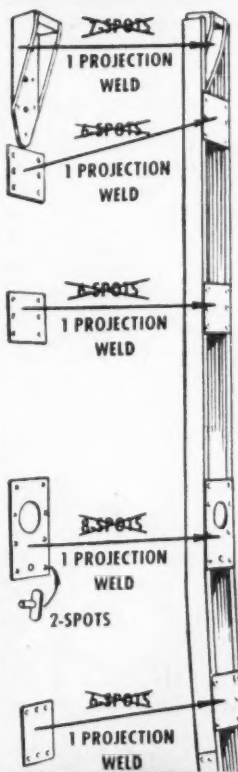

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Scrap Prices Turning Downward

Decline from formula price levels reported at some points and is expected to extend to other areas. Some buyers are accepting shipments only on firm contracts.

Cleveland—A feeling that a weakening in scrap prices is imminent pervaded the market last week. Although formula price for steelmaking grades still held here inasmuch as present orders run through March, there was definite belief in some quarters a decline from the formula will occur this month.

This belief is generated by the fact the worst of the winter is past, that the flow of scrap has increased substantially, and a sellers' conclusion that steel mills will not relax their resistance to above-the-formula prices.

Adding further to the easing in scrap is the steel mills' caution to avoid being caught with disproportionately large inventories in event of scrap price declines. Reflecting this attitude, some buyers are no longer buying on an open order basis but are accepting shipments only on firm contracts. This tends to discourage dealers and brokers from bidding up prices. Also contributing to the easing in scrap are anticipated arrivals this spring of considerable foreign scrap.

Strengthening the belief scrap prices will decline was the reported purchase last week at Chicago of steelmaking scrap at $1 below the formula price. However, a counter situation at Buffalo was watched also. There, price of steelmaking grades recently have been substantially above the formula, reportedly because of purchases by Canadian mills. This situation has put United States mills in the Buffalo area at a considerable disadvantage and expectations are the next few weeks will be critical ones there if the inflationary pressure on prices continues. Pressure may be relieved somewhat with opening of navigation around Apr. 15. However, there were reports last week that the pressure of buying at high prices in Buffalo would ease within a few days.

Trend toward price weakening in steelmaking grades had an effect on foundry grades here, where foundries were less inclined to buy at high prices.

Pittsburgh — Scrap dealers and brokers, who participated in recent large tonnage orders placed by major steel producers at the "formula" price level for steelmaking grades, are running into relatively little difficulty in covering commitments. Major scrap consumers contend daily shipments of scrap to yards have improved steadily in the last 10 days. For the first time since early December some mills have been able to slightly build up inventories, which were reduced substantially since the first of the year. One large mill has withdrawn from the market at the formula price of $40.50 for local open-hearth grades, but finds dealers and brokers show no interest in accepting commitments at a lower figure as long as large tonnage orders remain to be filled at the formula price. For remote scrap, leading mills have agreed to pay $2.50 springboard, making a top price of $43 for delivery here.

Critical shortage of cast scrap is reflected in wide price fluctuations on the limited tonnage moving. No. 1 cupola sold recently within the range of $61 to $62 and railroad malleable for over $75. Some easing is noted for railroad specialties, but most rail items are up $1 to $2 on recent awards.

New York — Open-hearth grades of scrap are moving actively, supplies coming out better as a result of milder weather and of consumers taking in the tonnage at formula levels. Brokers' buying prices on all grades of steel scrap and cast items are unchanged.

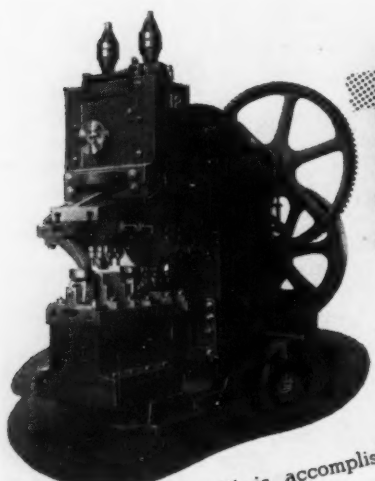
Boston — As steelmaking scrap prices settle generally to formula levels, cast iron scrap quotations mount to postwar heights of $65 to $70, delivered, for No. 1 cupola. Melters of cast scrap are firmly caught in an economics pinchers; lack of pig iron makes for abnormal ratio of scrap in melts, supply of cast grades is limited and (if production schedules are to be held) scrap must be acquired. Furthermore, there is no organized resistance to whirling prices. Melting steel scrap is slightly more active. Except against old orders, machine shop turnings and short shovel turnings are now at normal differentials with heavy melting. On new orders, brokers bid $26.90 for machine shop turnings and $28.90 for short shoveling. There are light orders for low phos steel scrap with $37, shipping point, offered.

Philadelphia — With supply more plentiful, there is a continued easing in steel scrap. No. 1 heavy melting steel is now $41.50 delivered and, while there is no change in the other open-hearth grades, all holding at formula levels, low phos grades are down to around $46.50 delivered. Electric furnace bundles are off slightly to a spread of $44.50 to $45.00.

Cast grades are stronger, with No. 1 cupola cast now holding at $63 to $64; No. 1 machinery cast, $65 to $66; charging box cast and heavy breakable cast, $59 to $60; clean auto cast $63 to $64.

Buffalo — Increased quantities of scrap are reported moving into Canada from the local area at prices about $2 above the buying formula of district mills. This is a major factor to offset talk of underlying weakness in the price structure as a result of improved weather conditions for scrap collections. While mills continue to bid $39.75 a ton for No. 2 heavy melting and bundles, only poor quality scrap is being offered to cover these orders. Better quality No. 2 material is bringing as high as $41.50 to $42. In addition, sales of No. 1 material are reported within a range of $43 to $45 with one sale up to $47.

Despite these sales, easiness in markets elsewhere have injected a nervous tone into the market here. Dealers, however, have been unable to buy at lower prices and deny reports of sales being made below the pricing formula. Mills likewise have no knowledge of business under the formula. While dealers' yard stocks



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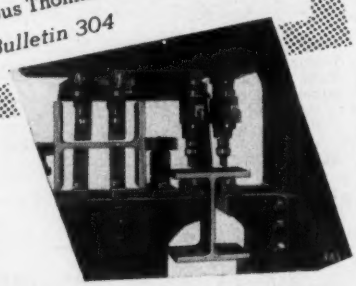

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remain low, mills note a pickup in recent receipts.

Confusion still prevails in the turnings market. Short shoveling offerings are moving locally at $36.75 to $37.25, while consumers at Niagara Falls are paying in the neighborhood of $39, freight charges included. Unofficial reports place rail malleable at $80 to $85.

Chicago — Scrap market continues to display a softer price tone with mills showing little interest in further acquisitions following recent heavy purchases. Receipts against orders placed at $39.50 a ton delivered for open hearth material are at a good rate. Production scrap still commands this figure, but it is unlikely that dealer offerings could be sold for more than $38.50. When mills next enter the market actively a lower price level is anticipated. Railroad material also shows signs of weakness, although not to the extent of other grades.

Cincinnati—Undertone of the scrap market is softer, with formula prices on steelmaking grades well established. Foundries have backed away from the prices which were paid in isolated cases earlier in the year, and appear well stocked in rails which have weakened. Shipments are higher with advent of better weather, but available supplies likely will be short at present rate of melt.

Birmingham — An easing process is reported in scrap. Receipts in dealers' yards have been bolstered by mild weather. Additional tonnage is moving at formula levels.

St. Louis—Scrap shipments continue to pick up gradually as the weather and labor supply improve. Prices are holding steady. Foundries are beginning to accumulate sufficient ground stocks to be discriminating in prices, in contrast to a month ago when they were operating hand-to-mouth on truck-load purchases at any figure. Mills have around 30 days' supply and show signs of pulling partly out of the market next month pending lower prices. Virtually no consumers are doing any substantial stocking up. An offering of 4000 tons of scrap was made late last week by the Frisco and Missouri Pacific railroads.

Seattle — To meet the invasion of Eastern buyers, foundries have raised the price of cast iron scrap from $35 to $40, hoping this move will bring larger receipts to local plants which have been desperately short of both pig iron and scrap. Outside buyers have to add $20 to the price paid here. A Chicago brokerage house has scattered offers in this area of $40, any tonnage available, paying in addition the $20 freight. By meeting outside competition, local foundrymen expect to ease the local shortage.

There is no change in the steel making grades, mills reporting receipts about equal to consumption but no surplus accumulating. The prevailing price is firm at $24. Mills state they are not paying more than $30 for cast iron scrap.

Quarterly Export Quotas Set on Metallic Compounds

Washington — Total authorized allocation of specified products for export during the first quarter have been announced by the Department of Commerce through its Office of International Trade as follows in pounds of material: Antimony oxide, 1,500,000; antimony sulfide, 30,000; chromic acid, 500,000; potassium bichromate and chromate, 1,100,000; chromium salts and compounds, 250,000; sodium bichromate and chromates, 5,244,902; chrome pigments, 900,000; lead acetate, 335,000; litharge, 650,000; dry red lead, 1,470,000; red lead in oil, 125,000; dry white lead,755,000; white lead in oil, 170,000; potassium chlorate and perchlorate, 4,000,000; potassium hydroxide, 5,000,000; naphthalene and naphthalene balls and flakes, 450,000; phenol, 7,000,000. Allocation for export of benzol totaled 1,500,000 gallons and of creosote or dead oil, 600,000 gallons.

Blast Furnace Operating Efficiency Declines

New York — The drop in production of pig iron per square foot of hearth area per day for six major producing companies from 1944 to 1947 ranged from 0.04 net tons to 0.33 net tons, based on data furnished to the American Iron & Steel Institute. The average loss for the six companies was 8 per cent, or 80 tons per day from a 1000-ton furnace. Losses in hot metal production were largely caused by poor quality coking coal and scarcity and poor quality of scrap of blast furnace grade.

In 1944, the year of maximum pig iron production, the furnaces of the industry consumed 1810 pounds of coke per ton of pig iron produced. By 1946, consumption had risen to 1868 pounds, an increase of 3.2 per cent.

Canada . . .

Toronto, Ont. — Iron and steel production in Canada during December declined slightly from that for November, but was substantially higher for the full year 1947 compared with 1946. Pig iron output in December amounted to 165,551 net tons, 72.4 per cent of capacity, against 174,147, 76.1 per cent, in November. For the month under review, output included 132,738 tons of basic iron, 16,334 tons of foundry iron, and 16,479 tons of malleable iron. Charges to blast furnaces included 312,779 tons of iron ore, 21,371 tons of mill cinder, scale, sinter, etc., and 5819 tons of scrap.

Production of ferroalloys in December amounted to 10,888 net tons.

Output of steel ingots and castings in December totaled 249,769 net tons, or 84.5 per cent of capacity, against 255,372 tons in November when the rate was 86.3 per cent. Output for December included 241,065 tons of steel ingots and 8704 tons of steel castings.

Following are comparative production figures for iron and steel in net tons:

	Steel Ingots Castings	Pig Iron	Ferroalloys
Dec. 1947 ...	249,769	165,551	10,888
Nov. 1947	255,372	174,147	11,551
Dec. 1946	237,300	161,464	11,766
12 mos. 1947	2,945,166	1,969,847	149,832
12 mos. 1946	2,334,631	1,403,767	116,996
12 mos. 1945	2,881,323	1,777,958	186,978

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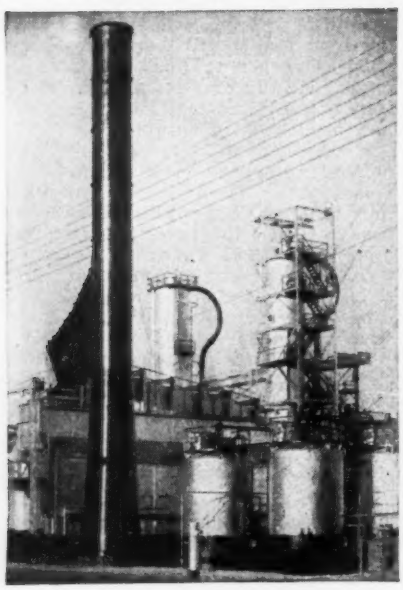

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Pig Iron . . .

Numerous foreign offerings reported, but buying has been relatively light

Pig Iron Prices, Page 152

New York — Pressure for iron continues strong with some foundries going far afield in an effort to obtain tonnage. One Connecticut concern recently purchased several hundred tons of Daingerfield, Tex., iron, paying about $96 a ton, delivered. Export offerings which are being quoted at still substantially higher levels are not attracting too much attention, although some scattered small orders are being placed. Current foreign offerings include Belgium iron at around $110, cif New York. A few hundred tons of Luxemburg high phosphorus iron is being offered. Swedish charcoal iron is now being quoted at $130, an increase of $30 from earlier in the year. Cumulative orders amounting to at least 250 tons are required by the producer, it is understood. Holland also is said to be offering some iron but on the basis of payment in steel products.

Swedish interests are offering foundry iron from Baltic ports other than their own at around $110 cif New York.

District buyers are pressing for iron purchased from the Pueblo, Colo., producer several months ago. Meanwhile no new iron is being offered here by this producer.

Foundry melt here last month on a daily basis was sustained at about the January rate. At some plants coke was in shorter supply actually than pig iron.

Boston — Almost without exception, foundries are unable to increase the ratio of pig iron to scrap in melts. With scrap $65 and more, delivered, costs are high. Not only are raw materials higher, but the cost factor is adversely affected by rejects, involving nearly 10 per cent of production at some foundries and probably a higher percentage in castings to be enameled and highly finished. Foundry operators are frequently estimating metal costs at the spout at 5 cents a pound compared with 1-1/2 cents prewar. Any material relief in this situation that might be contributed by pig iron is not in sight. There is slight chance for any increase in pig iron supplies in the near future, with the district depending largely on the Everett furnace for tonnage. Consumers who lost sources of supply by withdrawals of producers from this district are forced to scratch for iron; basic melters' supply is critical.

Pittsburgh—Many foundries in this area will be forced to curtail operating schedules if the indicated diversion of pig iron to favored industrial groups materialize. Most pig iron sellers are against establishment of the proposed government-sponsored allocation program. Industry members contend that they are best acquainted with the specific requirements of their customers, and believe that an impartial distribution of limited supply, with few exceptions, would be for the greatest benefit of all their customers. In this district, for example, there are some 38 ferrous foundries, less than a fourth of which would come under the "preferred" end-use programs.

Pittsburgh Steel Co. is said to be negotiating an emergency freight rate on all-rail shipments of iron ore from Mesabi range to Monessen, Pa. The matter has not been officially settled but the freight charge likely will not be more than $1.50 per gross ton above the combination vessel-rail cost. Company officials contend that it will be necessary to bring down considerable ore from the upper lake ports prior to the opening of navigation if current plans for starting melting operations in the recently-purchased 1200-ton DPC blast furnace around May 1 are to be accomplished.

Philadelphia — Pig iron consumers look for a slight improvement in March shipments, with some relief being afforded industry by a better flow of scrap. However, the gain over the next few weeks should be relatively slight at best. There is prospect also of a little betterment in movement of coke as milder weather sets in. Shortages of coke at some foundries have recently been more of a handicap than lack of pig iron.

Buffalo — Adoption of a voluntary allocation program is not expected to make any appreciable change in the acute pig iron situation. Iron already is being allocated to agricultural and railroad car casters since there is not enough iron to fill the expanded needs of foundries. As a result, foundries continue to operate on a curtailed basis with intermittent shutdowns. The outlook remains dark for New England and Seaboard consumers as sellers report no immediate prospects of iron being available for these points. Some foundries are paying exorbitant prices for cast scrap, but sales of top quality cupola scrap are leveling off within a range of $62 to $64 a ton. While outputs have been pared, two blast furnaces which are scheduled for relining in the near future are being pressed to alleviate the tight supply situation.

Cleveland — Additional tightness in foundry pig iron supply is attributed to sustained demand and necessity for blowing out certain furnaces for repairs. The shortage is so acute that despite phenomenally high scrap price foundries are holding to a minimum the proportion of pig iron in melts in order that the available quantity of pig can be stretched as far as possible.

Although gray iron foundries are reducing order backlogs, they continue to take all the pig iron they can get. The easing in backlogs stems partly from difficulty fabricators are experiencing in obtaining sufficient steel for products requiring castings also.

Chicago — Although pig iron shortage is the foundries' No. 1 problem today, short supply of coke and ferroalloys also presents difficulties and in a few cases coke is limiting operations. Metallurgical coke supply suffered when certain producers were obliged recently to consume more coke to maintain municipal gas supplies. Pig iron production is due to drop with Wisconsin Steel Co. blowing out its No. 2 blast furnace at South Chicago, Feb. 29, for relining and repairs, leaving only 38 of the district's 41 stacks operating. Steel plants continue to utilize bulk of iron production as hot metal in steelmaking, but there is hope that improved scrap sup-

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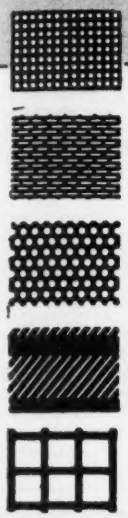

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EXACT PRESSURE CONTROL. Accurate, sensitive; secondary pressure setting repeats exactly regardless of fluctuating flow conditions. For use on primary air pressures up to 150 p.s.i. Maintains any desired secondary pressure 5 to 125 p.s.i.

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NO PRESSURE BUILD-UP. Absolute stability of secondary pressure even under dead end conditions.

FINE QUALITY. Small, compact, and moderately priced, but unexcelled for precision construction. Nylon valve seats. Instrument type control knob and fine threaded adjusting screw. All non-corrosive materials. Built-in fine mesh bronze strainer. Sizes 3/8" and 1/2".

ENGINEERING RECOMMENDATIONS. If you use or if you build air operated equipment, ask for Hannifin engineering recommendations. New bulletin on request.

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ply in the next few months may make more iron available for sale. Meanwhile, foundries gear their melting operations to raw materials availability, working shortened weeks when necessary.

Cincinnati — Tightness in pig iron supplies continues to restrict melt. Some of the strain in maintaining operations may be lifted soon with assurance of easier scrap and coke tonnages, and the advent of better weather which ends threat of gas shortages, blocked river traffic and other management worries. Some foundries are hopeful of a modest expansion in operation during March.

Birmingham — Pig iron supply situation is gloomy in this territory. Iron users are sending personal representatives to melters, but the story is little changed. The district's biggest independent producer said publicly this week demand was likely to stay at present levels through most of 1948 "if not through the entire year."

St. Louis—Some switching in pig iron consumption is noted, but the overall demand is unchanged. Stove makers are taking seasonally less iron, but demand from farm equipment manufactures is increasing. Close to 90 per cent of the district's iron now is furnished by Missouri-Illinois Furnaces Inc., and buyers from the outside report somewhat less difficulty in obtaining shipments. Some melters, however, could use double what is available. Consumers' ground stocks are virtually nonexistent. Production has been at capacity a year or more, equally divided between basic and foundry iron. Ore supplies are adequaee but coke inventories are down to a week's needs.

Building Outlook Good, Equipment Group Told

The construction industry can carry out a record dollar volume of construction activity under constantly improving conditions during 1948, unless materials requirements of the European Recovery Program cause crippling shortages in this country.

This forecast was made by Dwight W. Winkelman, president of Associated General Contractors of America, speaking at the recent 29th annual meeting of Associated Equipment Distributors in Chicago. Other speakers included Edward R. Carr, president, National Association of Home Builders; Tom Callaway, president of the American Road Builders Association; Ed Wimmer, vice president of the National Federation of Small Business; and Kenton R. Cravens, member of the American Bankers Association Credit Policy Committee.

The following were elected officers of the group: A. F. Garlinghouse, Garlinghouse Bros., Los Angeles, president; W. W. Bucher, R. E. Brooks Co., New York, executive vice president; V. J. Sheridan, Sheridan Equipment Co. Ltd., Leaside, Ont., Canada, vice president; C. F. Halladay, Halladay-Dettman Co., Sioux Falls, S. D., vice president; R. L. Arnold, Arnold Machinery Co. Inc., Salt Lake City, Utah, vice president; Eldon M. Farnum, Allied Construction Equipment Co., St. Louis, Treasurer; and F. G. Knight, executive secretary.

Furor Follows Price Advance in Semifinished

(*Concluded on Page* 60)

finished with the exception of carbon ingots melted in electric furnaces for automotive interests.

Still another large Pittsburgh district steel producer has made no change in its prices on semifinished, continuing to quote on the gross ton basis. It, however, is selling only what are described as insignificant tonnages of these products. Another mill has not changed its practice of quoting on the gross ton basis because it has contracts with an automotive interest which have several months to run.

Sales of semifinished products, it is pointed out, are not large in comparison with total production. Semifinished steel produced for sale in 1947, for example, totaled 3,105,646 million tons, compared with ingot production of 84,787,501 tons. This represents an increase of more than a million tons over 1946, reflecting the greater overall steel production last year and the greater activity of nonintegrated mills and other buyers dependent on purchases of semifinished. Postwar sales of semifinished have been much lower than during the war years, as indicated by the record:

Semifinished Sales

(Net Tons)

1947	3,105,646
1946	1,949,624
1945	4,724,688
1944	5,953,408
1943	6,067,583
1942	5,639,990
1941	4,847,487

The large shipments during wartime reflect the heavier shipments to United States allies and the demand for heavy steel forgings for war materiel.

Open Market Prices Higher—Large tonnages of semifinished steel products have been moving in the so-called open market at prices far in excess of the quotations by the major producers. Rerolling billets, blooms and slabs have been quoted at $45-$47 by the large interests, but open market transactions have been negotiated at $85 and upwards. Sheet bars are quoted at $60 nominally, but sales are reported in the open market at from $95 to $105. Tube rounds are quoted at $69 to $70, but some sellers are obtaining as high as $120 on a negotiated basis.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5200 tons of sheet piling and 327 tons of bearing piling, for U. S. Engineers, lock No. 2, Monongahela river, Braddock, Pa., to Carnegie-Illinois Steel Corp., Pittsburgh.

5000 tons, bridge over the Chesapeake & Delaware canal, Chesapeake City, Md., to American Bridge Co., Pittsburgh.

2400 tons, state bridge, Huntington county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

2400 tons, veterans hospital, Omaha, for U. S. Veterans Administration, to American Bridge Co., Pittsburgh; Peter Kiewit Sons Co., Omaha, contractor.

810 tons, second unit of the Port Jefferson, Long Island, steam generating plant of the Long Island Lighting Co., to Harris Structural Steel Co., New York; of the total, 550 tons of structurals were placed through Ebasco Services and 260 tons of boiler steel through the Combustion Engineering Co.

190 tons, cyclotron, electro magnet plant, University of Washington, Seattle, to Midvale Co., Nicetown, Pa.

185 tons, addition, telephone exchange, Laurelton, Long Island, through Irons & Reynolds Inc., general contractor, to Grand Iron Works, Bronx, New oYrk.

145 tons, building, P. E. Parry Inc., Richland, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, building, Brooklyn Borough Gas Co., Brooklyn, N. Y., through Christie & Leiser Inc., general contractor, to Grand Iron Works, Bronx, New York.

STRUCTURAL STEEL PENDING

2250 tons, transmission line, spec. 2115, Kingman, Ariz., for Bureau of Reclamation; bids March 11.

2000 tons, Jordan-Marsh department store, Boston.

1700 tons, factory building, Franklin Park, Ill.; J. Emil Anderson & Son, Chicago, contractor.

1700 tons, sheet piling, flood wall, Omaha, for U. S. Engineer, Omaha; bids postponed from Feb. 18 to Feb. 26.

1520 tons, tower structures, Stanolind Oil & Gas Co., Hugoton, Kans.

1392 tons, five highway beam bridges, Dallas county, Texas, for state.

500 tons, chemistry building, Rutgers University, New Brunswick, N. J.; bids postponed by state officials at Trenton, N. J., until Mar. 3.

450 tons, state bridge work, Route 25, sections 2E and 3E, Camden, N. J.; bids postponed until Mar. 5.

290 tons, agricultural building, Rutgers University, New Brunswick, N. J.; Elizabeth Iron Works, Elizabeth, N. J., low, with bids handled by state officials, Trenton, N. J.

280 tons, bridge, project U-085(34), Douglas county, Wis., for state; bids Feb. 24.

225 tons, towers, grillages and other items, transmission line; bids to Bonne-Power Administration, Portland, Oreg., Mar. 4.

220 tons, bridge, No. 2943, Madison City, Ind., for State Highway Department; Bebolt Construction Co., low on general contract; bids Feb. 17.

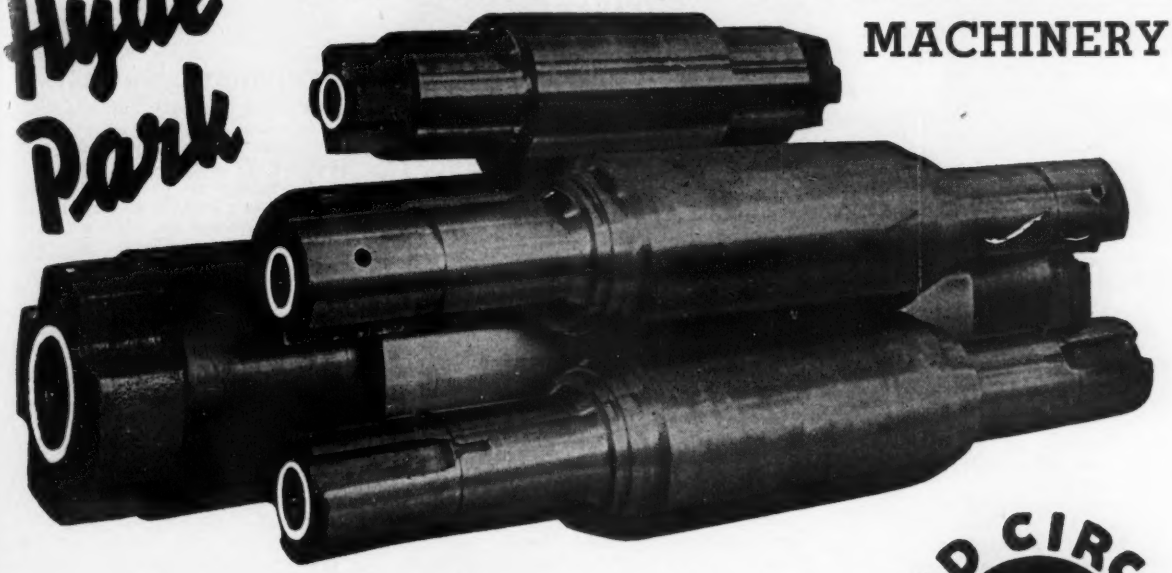
154 tons, bridge, project S-0150(1), Eau Claire county, Wis., for state ;bids Feb. 24.

140 tons, compressor house at gas plant, Consolidated Edison Co., Hunts Point, Bronx, N. Y.; bids asked.

135 tons, bridge, No. 3986, Red Lake Falls,

Hyde Park

CHILLED ROLLS and ROLLING MILL MACHINERY



RED CIRCLE Rolls CHILLED

This may be the Atomic Age, but in practice it is still the Steel Age—and one of the constant demands of this age is rolled steel products. To those who juggle rolled steel against prices and markets, superior equipment is frequently the difference between profit and loss. The Hyde Park Foundry and Machine Co. is equipped to design and manufacture individual chilled rolls or complete rolling mill units. Their accumulated knowledge of rolls, rolling mill machinery and procedure is available to all who inquire. Free consultation is part of our practice: you should take advantage of it.

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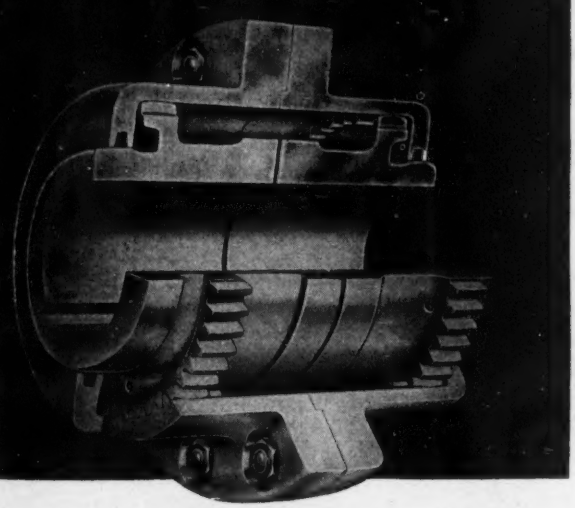
POOLE



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Seneca WIRE & MFG. COMPANY
• FOSTORIA, OHIO

REPRESENTATIVES AND WAREHOUSES IN PRACTICALLY ALL PRINCIPAL CITIES

Minn., for state; bids Feb. 24.

125 tons, Tongass National forest bridge, Alaska; bids to Public Roads Administration, Juneau, Mar. 8.

110 tons, bridge, No. 2929, Burr Oak, Ind., for State Highway Department; bids Feb. 17, none received.

100 tons, state bridge repairs, Union county, Pennsylvania; bids Mar. 12.

Unstated tonnage, veterans hospital, Altoona, Pa.; Mellon Stuart Co., Pittsburgh, low on general contract.

Unstated, 379-foot steel and concrete state bridge, Bannock county, Idaho; awarded to Henry L. Horn, Caldwell, low $130,918.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1100 tons, water works, Evanston, Ill., for city, to Bethlehem Steel Co., Bethlehem, Pa.; S. N. Nielsen Co., Chicago, contractor.

1000 tons, Columbia Basin project, Washington state, to Bethlehem Pacific Coast Steel Corp., Seattle.

700 tons, Columbia Basin project, to unstated California supplier.

100 tons or more, Washington state Medical Lake hospital addition, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

7150 tons Hungry Horse dam, Montana; bids to Bureau of Reclamation at damsite, Apr. 1.

350 tons, co-operative apartment building, Chicago; B-W Construction Co., Chicago, contractor.

340 tons, Bald Hill dam, N. Dak., for U. S. Engineer; Al Johnson Construction Co., Minneapolis, low on general contract; bids Feb. 11.

300 tons, building, Mary Knoll College, Glen Ellyn, Ill.; bids Mar. 1.

Unstated, 250,000-bushel grain elevator for Columbia County Grain Growers, Dayton, Wash.; general contract to Central Construction Co., Spokane, Wash.

PLATES . . .

PLATES PENDING

450 tons, for welded caissons, Jordan-Marsh department store, Boston.

400 tons, penstock, spec. 2066, Yakima, Wash., for Bureau of Reclamation; bids Feb. 12.

Unstated, 80 catamarans for U. S. Engineer, Portland, Oreg.; Gunderson Bros., Portland, low $104,212.

Unstated, steel sheet piling for bulkhead construction; bids to Port of Seattle, Mar. 3.

PIPE . . .

STEEL PIPE PENDING

Unstated, 83,185 feet 4-inch and 24,405 feet 10-inch pressure pipe for Ladner district, Vancouver, B. C.; bids in Feb. 25; D. M. Mathiesen, Vancouver, engineer.

Unstated, 7,300 feet 12-inch dipped 3/16-inch, alternative for cast iron; bids to L. R. Hills, city clerk, Colville, Wash., Mar. 2.

RAILS, CARS . . .

RAILROAD CARS PLACED

Duluth, Missabi & Iron Range, 1000 seventy-ton ore cars to Pullman-Standard Car Mfg. Co., Chicago, and 500 of the same type to General American Transportation Corp., Chicago.

Kansas City & Southern, 100 seventy-ton hoppers to General American Transportation Corp., Chicago.

Rock Island, 1000 all-welded "package" box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Southern Pacific, 250 covered hopper cars to American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Virginian, 25 caboose cars.

CONSTRUCTION AND ENTERPRISE

ALABAMA

SHEFFIELD, ALA.—Electro Metallurgical Co. has awarded a $300,000 contract to Hughes-Foulkrod Co., Schaff Bldg., Philadelphia, for construction of a mixhouse building.

CONNECTICUT

NEW HAVEN, CONN.—Detroit Steel Corp., 1025 Oakwood St., Detroit, has awarded separate contracts totaling $3 million for construction of a plant on State St. near Hamden line.

DISTRICT OF COLUMBIA

WASHINGTON, D. C.—National Bureau of Standards will receive bids until Mar. 8 for construction of an x-radiation laboratory and addition to its high voltage annex.

GEORGIA

CORNELIA, GA.—Chicopee Mfg. Corp. of Georgia has awarded an $83,000 contract to Daniel Construction Co., Greenville, S. C., for construction of a plant addition.

ILLINOIS

CHICAGO—Grand Trunk Western Railroad, A. N. Laird, chief engineer, 441 Jefferson St., Detroit, has awarded a $775,000 contract to Ellington Miller Co., 25 E. Jackson Blvd., for construction of a freight warehouse.

DOLTON, ILL.—United States Steel Products Co., U. S. Steel Corp. subsidiary, has awarded a contract to F. H. McGraw & Co., Chicago, for a 32,000-sq-ft addition to its plant here.

PITTSFIELD, ILL.—Illinois Rural Electric Co., Winchester, plans to build a $100,000 power plant. Engineer is Stanley Engineering Co., Hershey Bldg., Muscatine, Iowa.

INDIANA

HUNTINGTON, IND.—Majestic Co., D. A. Purviance, president, has awarded a $200,000 contract to Russell Carey for repairs to a factory damaged by fire.

IOWA

DES MOINES, IOWA—Des Moines Industries Inc., 407 37th St., has awarded a $600,000 contract to Weitz Co., 406 Fleming Bldg., for construction of a furnace plant. Lessee will be Armstrong Furnace Co., 1639 Olentangy River, Columbus, O.

KANSAS

TOPEKA, KANS.—Hall Lithographic Co., 623 Kansas St., will build a $500,000 plant.

KENTUCKY

PIKEVILLE, KY.—Baltimore & Ohio Railroad, A. C. Clarke, chief engineer, Baltimore and Charles Sts., Baltimore, will spend $50,000 to construct tracks serving a mine development here.

LOUISIANA

HARVEL, LA.—Texas Co., Texas Bldg., Houston, has awarded a $225,000 contract to Associated Constructors & Engineers, 4001 Homestead Rd., Houston, for construction of 15 miles of pipeline in this vicinity.

NEBRASKA

SOUTH SIOUX CITY, NEBR.—Automatic Equipment Mfg. Co., Pender, has awarded a $75,000 contract to Hardy Construction Co., Sioux City, for erection of a branch factory.

NEW JERSEY

CAMDEN, N. J.—General Chemical Co., 1100 Line St., has awarded separate contracts totaling $150,000 for extensive alterations to Bldg. 26.

NEW MEXICO

JAL, N. MEX.—Texas Pipe Line Co. and associates, Texas Bldg., Houston, Tex., has let a $2,975,000 contract to Morrison Bros. Construction Co., Odessa, Tex., for erection of a crude oil pipeline between Jal and Midland, Tex.

NORTH CAROLINA

CHARLOTTE, N. C. — Precision Research Corp. has been incorporated by Harry Frohman as president with capital of $100,000.

GREENSBORO, N. C.—Sears, Roebuck & Co. has let a $700,000 contract to Southeastern Construction Co., 218 W. Second St., Charlotte, for construction of a paint factory.

OKLAHOMA

OKLAHOMA CITY, OKLA.—Interstate Oil Pipe Line Co., N. E. Tenth St., will build a $386,000 pumping unit with a capacity of 37,000 bbl daily.

PENNSYLVANIA

FERNWOOD, PA.—Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit, plans to build a $75,000 plant addition here. Architect is Ballinger Co., 105 S. 12th St., Philadelphia.

NORRISTOWN, PA.—American Equipment Division, Pittsburgh Screw & Bolt Corp., has awarded a $75,000 contract to Frank R. Heavner, Montgomery Trust Arcade, for factory additions and alterations.

READING, PA.—Parish Pressed Steel Co., Robeson and Weiser Sts., has awarded a $70,000 contract to L. H. Focht & Son Inc., Baer Bldg., for construction of a manufacturing plant.

TITUSVILLE, PA. — Universal Cyclops Steel Corp., 701 E. Spring St., plans to spend about $300,000 on an expansion program which includes construction of an annealing building, two rolling mill buildings and an ingot storage building.

SOUTH CAROLINA

HARLEYVILLE, S. C.—Caroline Giant Cement Co., 1700 Sansome St., Philadelphia, will build a $175,000 cement manufacturing plant.

CANADA

BURNABY, B. C.—Standard Oil Co. of B. C. Ltd., 355 Burrard St., Vancouver, plans to build a $500,000 plant with daily output of 175 tons of all grades of paving asphalts. Facilities will include additional boiler, 12 storage tanks, and tank car loading area.

VANCOUVER, B. C.—MacMillan Export Co. Ltd. has announced plans for early construction of a $12 million pulp mill on Vancouver Island, with an expected daily capacity of 200 tons of bleached sulphite or 225 tons of unbleached pulp.

WINNINPEG, MAN.—Winnipeg Hydroelectric System, 55 Princess St., has awarded a $260,000 contract to Babcock-Wilcox & Goldie-McCulloch Ltd., 805 Electric Railway Chambers, for a steam generating unit.

BELLEVILLE, ONT.—Canada Cement Co. Ltd., Canada Cement Bldg., Montreal, Que., has awarded a $4 million contract to Carter Construction Co. Ltd., 419 Cherry St., Toronto, Ont., for erection of a project to double manufacturing facilities.

COBALT, ONT.—Silanco Mining & Refining Co. Ltd., 45 W. Richmond St., Toronto, has awarded a $150,000 contract to General Engineering Co. of Canada Ltd., 100 Wadelaide St., Toronto, for a rehabilitation project to include installation of a central heating system and extension of the water system.

NIAGARA FALLS, ONT.—Animal Trap Co. of America, J. W. Woolworth, general manager, 1781 Ellen Ave., has awarded a $125,000 contract to Robertson Construction & Engineering Co. Ltd., 512 Clifton Ave., for erection of a plant.

OTTAWA, ONT.—Bell Telephone Co. of Canada Ltd., 105 Beaver Hall Mill, Montreal, has awarded a $300,000 contract to Ross-Meagher Ltd., 9 Echo Dr., for construction of a warehouse and garage.